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UNIVERSITY OF ALBERTA

Context and Meaning Ascription in Visual Art

BY

Thomas Cameron Wild

(C)

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements of the degree of Doctor of Philosophy.

DEPARTMENT OF PSYCHOLOGY

EDMONTON, ALBERTA

SPRING, 1993

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled Context and Meaning Ascription in Visual Art submitted by Thomas Cameron Wild in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Psychology.

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Abstract

Literary accounts of aesthetic experience attribute enriched and deepened meanings to works of art. However, psychological theory and research has tended to ignore such descriptions. This dissertation attempts to provide a new foundation for psychological aesthetics by integrating cognitive, experimental, and phenomenological perspectives. A cognitive theory of meaning generation is presented, according to which (1) individual differences in art background and absorption (Tellegen & Atkinson, 1974) mediate differences in three meaning ascription processes (figure-ground differentiation, synaesthetic ascription, and metaphoric elaboration), and (2) musical structure and tonality affect meanings ascribed to a painting. These hypotheses were evaluated in a two-session experiment in which 68 participants ascribed meanings to a variety of visual and auditory stimuli. Results provided substantial support for both hypotheses. Consistent with hypothesis 1, individual differences in art background and absorption were associated with faster figure-ground differentiation in a Gestalt Closure test, and more productive figure-ground differentiation in a painting description task. Also, art background and absorption were associated with enhanced reliability of colour-sound attributions in a tone judgement task and with enhanced vividness of imagery in response to a musical excerpt. Hypothesis 2 was evaluated by having participants view Paul Klee's Composition under one of three conditions: atonal music while viewing Paul Klee's Composition, tonal music while viewing the Klee piece, and a no music control condition. Musical structure and tonality influenced interpretations of an ambiguous abstract painting such that tonal, repetitive music enhanced cross-modal integrative processes during contemplation of the visual artwork. Ascription of meaning to visual art depends on organismic resources and environmental context operative during aesthetic contemplation. These results provide some support for integrative conceptions of aesthetic experience found in literary accounts.

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Introduction

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"Wordsworth, from Tintern Abbey"

Wordsworth's poetic images describe aesthetic experience, exceptional moments that can occur while contemplating a natural event or a created art object. Such moments are imbued with concretely lived and bodily felt meaning. Wordsworth's skillful account of aesthetic episodes poses important questions about the nature and meaning of our experienced world. But his poem provides only subtle hints about avenues of inquiry that might be pursued in order to understand this phenomenon and explicate its rich complexity. For instance, what is this "appetite, a feeling, and a love" that suffuses his experience of the forms and colours of the

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tall rock, the mountain, and the gloomy wood? Certainly it is more than mere 'pleasure' or 'preference'. What is this "sublime presence" felt and experienced in setting suns, blue skies, and occasionally in all objects of thought? Certainly it is more than simple 'wonder'. How can the eyes and ears "half create" the "deeply interfused" meanings present in Wordsworth's experience of the river Wye?

These questions, and more, are raised when one begins to reflect on Wordsworth's poem. But we must resist the temptation to oversimplify the phenomenon in a premature rush toward conceptual and intellectual clarity. Instead, we should carefully study moments of aesthetic experience in their lived complexity: responses to the kalidescope of colour, sound, and drama in the best cinema and theatre; musical moments that are so palpable that they provoke bodily reactions such as tingling and constriction of the throat, etc. Such episodes evoke imagery, memories, and associations with such tangibility that we feel transported to another time and place. These experiences resist clear description and effortless translation into familiar conceptual categories. Yet these phenomena, when considered in their full complexity, point to the human capacity to endow life with meaning, drawing on seen, heard, and felt qualities of our life-worlds.

The difficulty of providing a clear explication of aesthetic experience has made it a longstanding and problematic scholarly topic. Today, at the close of the twentieth century, three communities have made claims about aesthetic experience: artists, philosophers, and psychologists. Each of these communities has been forced to acknowledge the limits of explicability. Artists themselves remain deeply distrustful that conceptual or empirical analyses will ever shed light on the phenomenon. Some artists elevate this argument into a matter of faith, in effect denying the possibility of understanding aesthetic experience altogether.

For their part, philosophers are perplexed that philosophical aesthetics has perhaps become the most fragmented, divisive, and ideologically varied specialty in the philosophical family (McCormick, 1991). In their search for intellectual clarity, philosophers have debated the meaning of art, aesthetic experience, beauty, taste, expression, etc. But the longer these debates rage, the farther away the subtle power of Wordsworth's account seems. Such is the current malaise among artists and philosophers of aesthetics that the analytic philosopher Arthur Danto was hard-pressed to define the scope of the field: "We have entered a period of art so absolute in its freedom that art seems but a name for an infinite play with its own concept" (quoted in Dissanayake, 1992, p. xiv).

And then, psychologists also have sensed the importance of aesthetic episodes and have proposed different routes

toward understanding aesthetic experience. Like the philosophers, they have myriad descriptive and explanatory concepts for explicating aesthetic experience: empathy, pleasure, preference, novelty, symbolization, and so on. But psychologists can be accused of devaluing the experiencing human subject in their zeal to adopt a natural-scientific mode of discourse about aesthetic experience. In its haste to provide mechanistic causal theories and transparent measurement operations, psychological aesthetics today resembles a grab-bag of positivist epistemology, hedonistic assumptions, operational definitions, and speculative physiology.

We are left in a disagreeable predicament. Wordsworth speaks to us with urgency about the importance of aesthetic experience in human affairs. Examples from our own lives confirm the concrete and tangible impact of aesthetic experience. But when we turn to artists, philosophers, and psychologists in order to understand the phenomenon, we become confused in an array of definitions, distinctions, and models.

I believe that this confusion is rooted in conceptual and empirical analyses that fail to acknowledge what was so central to Wordsworth's and others' (e.g., Dewey, 1934) accounts of aesthetic contemplation: its integrative character. In Tintern Abbey, Wordsworth presents a nascent theory of how human experience is enriched and deepened in aesthetic experience. The pivotal ingredients in this account appear to be the formation and integration of meaning. Wordsworth obliquely refers to these processes when he speaks of the colours and forms of the gloomy wood being experienced as an appetite, a feeling, and a love. Here, spatial and felt qualities have been formed and integrated to enrich experience. He also refers to these processes when he speaks of the 'sublime presence', the 'motion and spirit' felt in setting suns, blue skies, and in the mind of man. These meanings have been formed (i.e., constituted) and integrated in a 'deeply interfused' manner. And when Wordsworth refers to how the eyes and ears 'half create' the spectacles we behold during aesthetic experience, he endows our senses with characteristics that potentially deepen meaning in human experience, via integrative processes.

Our capacity to constitute and integrate seen, heard, and felt meanings is the focus of the following study. This focus provides a guiding theme with which to rejoin the philosophical and psychological controversies regarding aesthetic experience. The general task of this thesis, then, is to give flesh to Wordsworth's skeletal account of how colours and forms can be 'half-created' by the eyes and ears so that deepening of meaning is experienced.

First, I want to articulate just how experimental aesthetics has failed to illuminate the creation and integration of meaning, the phenomenon so central to

Wordsworth. Second, I will provide a new foundation for psychological aesthetics by combining the best of current cognitivist theory with concerns for how meaning is ascribed in human experience. Finally, I will present research that orients us again to the task of explicating moments of aesthetic experience in their full complexity. By focusing on the constitution and integration of meaning and returning to the task of patiently describing aspects of experience, we may be able to explicate aesthetic experience in a manner more faithful to Wordsworth's account.

Chapter I.
Experimental Aesthetics: A Search for Tangibility

A. Stylistic Codification and Parameters of Aesthetic Response

Individual artworks can, by virtue of their common features, be categorized into styles associated with particular historical and cultural periods. In any historical/cultural community, style is identified by a constellation of meaningful practices that are frequently codified into systems of conventions. Artists use these stylistic conventions creatively, as in the development of the diatonic and chromatic scale, as in the development of cubist painting, and so on. As well, art appreciators learn to understand these stylistic conventions and use this understanding to ascribe meanings to artworks (Gombrich, 1960). Stylistic evolution arises out of interaction within a community of artists and appreciators, and follows a course of historical change. Meanings ascribed to art are therefore not fixed but are malleable, dependent on shifting stylistic conventions and cultural sensitivities to those conventions.

This conception of stylistic evolution is important because of a tendency in experimental aesthetics to assume that the results of stylistic reflection, notation, and codification reveal the basic elements of aesthetic responses, e.g., elements of pictorial and/or musical perception and cognition. The tendency to yoke conceptions of aesthetic response to stylistic conventions dilutes and obscures the full complexity of our lived experience of art objects and natural spectacles. That is because stylistic codification offers only post hoc analyses of dimensions having questionable links to the integrative, unified character of aesthetic experience.

Consider, for example, Serafine's (1983) recent account of musical style. She argues that in musical communities, style is always a post hoc result of reflection and codification of musical practice. Gregorian chant, as one instance, was notated only after many years of Christian prayer in song. Notation of musical conventions and practices results in a relatively homogeneous conception of style that becomes institutionalized for the musical community, providing a set of tools for novel musical practices, new acts of reflection and codification, and ultimately, changes in stylistic conventions. Artistic practices make use of pre-existing stylistic conventions and rules, but transcend them in further practice. New musical qualities and forms arising out of preexistent conventions require notation and codification; this process facilitates shifts in style over time.

However, recent work in the psychology of music betrays Serafine's observations. Considerable effort has been

expended trying to determine how people perceive chromatic and diatonic tonality and harmonic relations such as the tonic and dominant (see Deutsch, 1982; Dowling & Harwood, 1986; Krumhansl, Bharucha, & Castellano, 1982). The perceptual/cognitive system, on this view, instantiates musical experience for the listener in a manner consistent with the 'rules' of European classical music (see also Lerdahl & Jackendoff, 1983). To assume, however, that the perceptual/cognitive system is inherently structured to apprehend such tonalities and harmonic relations belies the fact that tonality and harmony are themselves contingent products of deliberate reflection and codification of European classical music practices.

Because other European and world musics are explicitly atonal or pantonal (e.g., Schoenberg), and as these other forms of music are meaningful for (at least some) listeners, the perceptual-cognitive system appears not to have a predilection for ascribing meaning to music in terms of the codified practices of classical European tonality and harmony. It is only when music perceivers adopt a certain frame of reference toward music in terms of classical European tonality, whether through formal training or through repeated exposure, that music 'makes sense' or is meaningful in such terms (see Cage, 1971).

Reliance on current stylistic conventions and rules to determine universal, a priori parameters of aesthetic response unnecessarily constrains perceptual and cognitive processes involved in response to art. By yoking perceptual and cognitive processes to the results of stylistic analysis, experimental aesthetics marginalizes active contributions of the art appreciator and makes them subservient to predetermined stylistic conventions. The result is a homogenized conception of aesthetic experience.

Instead of an a priori conception of style governing aesthetic response, a more careful and appropriate analysis would focus on the interplay between contingent stylistic conventions and our response to those conventions. Just as we are prepared to acknowledge that artists use stylistic conventions but transcend them in further practice, so too do appreciators use stylistic conventions to understand art, but transcend the limitations of stylistic concepts as aesthetic experience deepens and enriches experienced meaning.

Stylistic codification, in conjunction with theoretical assumptions about the nature of aesthetic response, has motivated neglect of the richly integrated meanings 'given' to the appreciator during aesthetic contemplation. It is important to appreciate how this orientation emerged in contemporary experimental aesthetics.

B. Aesthetics from Below: An overview and critique

Perhaps no other development in the psychological literature has influenced the course of experimental studies as much as the research tradition known as "aesthetics from below". With the publication of Fechner's Elements of Aesthetics in 1876, experimental aesthetics established itself as one of the original specialty areas in psychology. In that volume, Fechner bequeathed a metatheory and methodology that still influence the field, largely via Berlyne's book Aesthetics and psychobiology (1971). Berlyne adopted many of Fechner's assumptions and elaborated his original positions on the nature of aesthetic response. As we will see, the Fechner-Berlyne conception of aesthetic response is problematic on two counts: (1) excessive reliance on objective stimulus properties as definitive of beauty and as determinants aesthetic response, and (2) excessive reliance on a hedonistic conception of aesthetic response. Aesthetics from below promotes a conception of aesthetic response that bears little resemblance to the integrated, meaningful accounts offered by Wordsworth and other authors.

1. The primacy of the stimulus

Fechner and Berlyne begin from the position that aesthetics "from above", i.e., speculative and philosophical aesthetics, should be supplemented with empirical facts about aesthetic behaviour.[1] Their empirical efforts in part attempted to inductively characterize stimulus properties governing aesthetic responses. Fechner initiated this approach by advocating the method of measurement wherein the investigator quantifies and experimentally varies dimensions of stimuli supposedly having distinctly aesthetic effects. For instance, his "golden section" hypothesis proposes that rectangles approximating the length-to-width ratio of 1 : 0.62 are most preferred by observers, compared with rectangles differing successively from these dimensions.[2] Fechner banished mediational and associationist accounts in his theory and held that objective stimulus properties (such as proportion) are the sole determinants of aesthetic response.

Berlyne (1971) adopted Fechner's reasoning about the primacy of stimulus properties and expanded it by describing a class of "collative" stimulus properties such as complexity, novelty, and uncertainty. These properties were regarded as a parsimonious redescription of the form and composition of art. Like Fechner, Berlyne's research efforts attempted to systematically quantify and vary collative variables in order to assess their effects on the observer.

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1. In "The other Gustav Theodor Fechner" Arnheim (1986) notes ambiguities and points of contrast between Fechner's empirical and metaphysical interests. Cupchik (1988) similarly comments on tensions between Berlyne's empirical and humanistic scholarly interests.

2. For a recent review of research along these lines, see Benjafield (1985).

But unlike Fechner's nonmediational theory, Berlyne proposed a complex account of how objective stimulus properties cause aesthetic responses via lawful relations between collative properties and changes in the appreciator's level of arousal.[3] Despite differences with regard to mediational processes, Fechner and Berlyne were united in the view that objective stimulus properties cause aesthetic response, and as such, constitute the primary independent variables in experimental studies.

An important limitation of stimulus-governed conceptions such as these is that the appreciator is characterized as a passive recipient of critical stimulus parameters. The appreciator plays no active role in the constitution of aesthetic response. In Fechner's view, people passively receive stimulus properties that directly produce aesthetic effects. Although Berlyne's mediational account linked stimulus properties to arousal and aesthetic response, he also downplayed active contributions of the conscious art appreciator. The person, on Berlyne's view, merely generates changes in arousal in response to collative properties. For Fechner and Berlyne, then, the eyes and ears do not 'half create' aesthetic experience; rather, they simply transduce causal effects of stimulus properties. Alternatively, Wordsworth's nascent theory of aesthetic experience would hold that aesthetic response is dependent on active contributions of the appreciator in the creation and integration of meaning. And it is counterintuitive that Wordsworth was merely a passive recipient of stimulus properties during his moments of aesthetic experience.

An additional, though perhaps unintended, consequence of the Fechner/Berlyne emphasis on the primacy of the stimulus is that their characterizations of stimulus properties can be interpreted as systematic codification or notation of 'the beautiful'. In the case of visual objects, for example, Fechner codified stimulus properties such as proportion. Berlyne codified visual objects in terms of the number and arrangement of elements, relative proportion of each element's occurrence, and so on.[4] The purpose of such notation was to allow researchers to inductively determine stimulus properties causing the greatest aesthetic effects in observers.

These efforts to empirically determine objective stimulus parameters eliciting maximal pleasure were interesting, but they left many unresolved issues. First, codification of stimulus properties did not distinguish

---

3. These effects arise through the process of information transmission from the stimulus object to the appreciator. An information-theoretic analysis of the transmission process was adopted (Berlyne, 1971; 1974) according to which semantic, expressive, cultural, and syntactic information independently compete "for the limited capacity of the channel linking them to the work" (Berlyne, 1974, p. 6). Information transmission affects arousal, which in turn affects liking and preference for the stimulus.

4. See Crozier (1974) for similar efforts in the domain of sound.

between actual art and other stimuli in terms of properties intrinsic to works as cultural artifacts. Instead, Fechner and Berlyne thought that all stimuli possess codified properties to a certain degree. A soft-drink can is in this sense equivalent to a Picasso; both possess codified properties (e.g., proportion, arrangement of elements), and they could be equally 'beautiful' if they possessed the requisite pattern of stimulus properties stipulated by the notation system. But this is a strange conception of beauty that skirts many of our intuitions.

Second, stimulus codification did not adequately address historical changes in artistic practices or changes in conceptions of beauty. Conventions governing representational painting (e.g., linear perspective) are in this sense equivalent to stylistic conventions in other periods (e.g., surrealism's emphasis on figural distortion). The two styles differ only insofar as they exhibit different patterns of codified stimulus properties (e.g., probability of a figural element's occurrence). If this is so, historical fluctuations in style and conceptions of beauty are irrelevant with respect to the basic 'vocabulary' of stimulus properties: Renaissance and surrealist painting are directly comparable in terms of values on a single scale within the codified notation system, despite wide differences in artistic intentions across styles. The upshot is that the codification systems proposed by Fechner and Berlyne promote a transcendental conception of beauty that is not sensitive to historically-bounded changes in style.

Perhaps in anticipation of these arguments, Berlyne (1971) proposed a distinction between synthetic and analytic stimuli. The former are constructed by the experimenter(s) to vary in terms of collative informational properties such as novelty, uncertainty, and complexity (Berlyne, 1969), while the latter consist of reproductions of artworks such as paintings (Berlyne, 1976). On the surface, Berlyne's distinction provides experimental aesthetics with a way to investigate reactions to culturally-defined artworks and a link to historically bounded conceptions of beauty. Experiments using synthetic or constructed stimuli placed codified stimulus parameters under the researcher's control, and attempted to confirm explanatory hypotheses regarding the effects of collative properties on appreciators (Berlyne, 1971; Masden, 1981).[5] Studies using analytic stimuli, on the other hand, sought to reduce stylistic variations in actual artworks to a smaller set of art-historical parameters. The reduced set of 'basic' stylistic parameters could then be linked back to the underlying vocabulary of collative stimulus properties governing aesthetic response

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5. An impressive body of evidence regarding the effects of collative properties of synthetic stimuli on observers has in fact been generated by Berlyne and colleagues to support these hypotheses (see Berlyne, 1974).

(e.g., Berlyne, 1976; Berlyne and Ogilvie, 1974; Cupchik, 1974; O'Hare, 1981).

These proposals were interesting and potentially important. All stimuli, including mundane objects and artworks from varied periods are in principle translatable into codified stimulus parameters, the 'real' causal forces underlying aesthetic response. However, Berlyne's attempts to grapple with the concept of artistic style failed. In fact, no body of evidence has been provided by Berlyne and colleagues regarding relations between historically situated variations in specific artistic styles and collative stimulus properties such as complexity and uncertainty.

But the larger issue raised by attempts to provide a general or universal codification scheme for beauty and for artistic styles is that such notation schemes inevitably generate tensions between contingent codification practices and presumed universals of beauty and aesthetic response, as argued above. Attempts to codify stimulus properties imply that particular patterns of proportion, complexity, uncertainty, and so on predetermine the nature of aesthetic response. In other words, people are inherently structured to respond aesthetically to particular 'beautiful' configurations of properties defined by the notation system.[6] As I argued above, this is very much like the tail wagging the dog: contingent results of stimulus codification are presumed to govern parameters of aesthetic response. In the final analysis, redescription of art in terms of an abstract or universal notation system posits a priori dimensions of stimuli and responses that bear little resemblance to either the variety of extant artistic styles or to the rich complexity of aesthetic experience described in literary accounts.

To summarize, Fechner's method of measurement casts a shadow over experimental aesthetics in two ways. First, by situating the relevant causal factors in the stimulus, aesthetics from below devalues the constructive role of the appreciator, who becomes nothing more than a passive recipient of stimulus properties. Second, the search for a general notation scheme of stimulus properties continues to promote the notion that there is an abstract and transcendental description of beauty that is insensitive to history and culture. Berlyne's efforts to distinguish actual art from other stimuli was illusory because of his view that concrete stylistic parameters could be translated into information-theoretic codes in his collative notation system. Even if such a notation system were developed fully, it would provide only an a priori set of parameters within which aesthetic response operates. The primacy of the stimulus

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6. For Fechner, the organism is innately prefigured to be sensitive to proportion, for example. For Berlyne, the organism is innately prefigured to be sensitive to collative informational properties, for example, uncertainty and complexity.

thus functions to devalue the constructive role of the appreciator by yoking his or her reactions to stimulus parameters assumed to be universal elements of beauty and assumed to be invariant across observers. On this view, Wordsworth passively registered an objective 'sublime presence' with certain informational features.

2. The primacy of stimulus choice

On the response side, aesthetics from below holds that aesthetic response is essentially a form of stimulus choice. Fechner originated this notion by emphasizing the method of selection in which subjects choose between presented stimuli on the basis of preference. Fechner's position is that we prefer certain stimulus configurations over others because they directly elicit maximal pleasure. Preference thus represents the fundamental outcome measure in experimental studies.

Berlyne (1971) adopted Fechner's method of selection and incorporated his assumptions about the preference-based nature of aesthetic response. Specifically, he proposed a generalization of the Wundt curve, which links stimulus intensity to experienced pleasure, and applied the same reasoning to collative stimulus properties. Thus arose Berlyne's predictions about inverted U-shaped functions relating stimulus complexity to pleasure.[7]

Berlyne also offered improvements to Fechner's assessment techniques by proposing an array of measures to assess pleasure in response to presented stimuli. Physiological recordings are designed to assess central and peripheral arousal in response to stimuli. Measures of exploratory behaviour assessed preference for stimuli, and consist of exploration time (e.g., the participant determines the duration of presented stimuli) and exploratory choice (e.g., the participant selects one of two or more stimuli for further viewing). Finally, verbal judgements consisted of participant ratings on scales designed to assess (1) subjective analogues to collative stimulus properties (e.g., Ertel, 1973), and (2) rated pleasure and interest for stimuli (e.g., Berlyne and Peckham, 1966; Biaggo and Suplee, 1985).

Despite these innovations, Berlyne never questioned Fechner's assumptions about the method of selection, i.e., that aesthetic response is essentially linked to pleasure and that pleasure is reflected through stimulus preference. Virtually all of the research generated by Berlyne and colleagues therefore presented subjects with two or more (analytic or synthetic) stimuli at a time, while assessing verbal, exploratory, and physiological responses to all possible pairs (or triads) of stimuli. The strengths of comparative methodologies are that (1) generalizability of

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7. Moderately complex stimuli are hypothesized to elicit maximal pleasure, in comparison to low or high-complexity stimuli. Note, however, Berlyne's differentiation between the effects of stimulus complexity on pleasure and interest (Berlyne & Peckham, 1966).

results across the sample of stimuli is assured, and (2) the procedures provide a good analogue to some forms of aesthetic behaviour (e.g., comparative assessment of paintings at a gallery).

But the method of selection inherently suffers from limitations. Inverted U-shaped functions relating preference and informational properties of stimuli are influenced by the range of stimuli selected for presentation (e.g., Kennedy, 1961), as well as by the context (e.g., sequence) of stimulus presentation (Lindauer and Dintruff, 1975; Steck and Machotka, 1975).[8] These limitations suggest that art appreciators' preference judgements are sensitive to the content of stimuli as well as their informational properties. Such judgements also reflect the context within which such judgements are made. Stimulus preferences seem to be influenced by additional factors beyond the codified aesthetic vocabulary, and perhaps reflect more than just experienced pleasure.

The method of selection can therefore be criticized because it offers a unidimensional conception of aesthetic response. That is, stimulus properties are hypothesized to cause changes along a single dimension of experienced pleasure. This hedonistic conception of aesthetic response underestimates the power of art to evoke nonpleasurable, meaningful reactions, as occurs in tragedy, or in contemplation of avant-garde works. It would be a mistake to assume that Wordsworth merely experienced heightened pleasure during his contemplation of the gloomy wood. As Wordsworth suggests, our experience during aesthetic episodes is far more differentiated and integrated than is suggested by values on a single continuum of experienced pleasure.[9]

The unidimensional nature of aesthetic response proposed by Fechner and Berlyne has undermined attempts to investigate meaningful and integrated experiences of appreciators. The method of selection inevitably dilutes and trivializes aesthetic experience by constraining subjects' responses to finger pointing (at worst, "I liked this one better than that one") or to scale ratings (at best, "This one has an pleasure rating of 7, that one 3").[10]

Arnheim (1986) notes that reliance on verbal preference judgements ..."tell us deplorably little about what people see when they look at an aesthetic object, what they mean by

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8. Kaplan (1987) reviewed research indicating that there are reliable effects of stimulus content on preferences. Thus, people may prefer landscapes to urban environmental stimuli independently of informational properties such as stimulus complexity.

9. In a similar vein, Meyer, 1956) notes that "...a Beethoven symphony is not a kind of musical banana split, a matter of purely sensuous enjoyment" (p . 6).

10. In an important chapter, Lindauer (1981) suggests that one reason why investigators have relied solely on nonexperiential classes of dependent measures (arousal, exploratory behaviour) is that a behavioural metatheory underlies much of the research in current experimental aesthetics (see also Masden, 1981). Not being interested in 'subjective' mental events, behaviourists such as Berlyne eschew experiential dependent measures.

saying they like or dislike it, and why they prefer the objects they prefer." (p. 45). Arnheim's criticisms suggest that verbal or scale judgements of preference only provide a rough indication of key constructs in processes of art appreciation. As I have argued, this is because many of the rating scales do not abandon the assumption that aesthetic response is essentially a form of pleasure. In addition, participants are required to respond to stimuli on the basis of a priori dimensions selected by the investigator instead of dimensions selected by the participants themselves. A subject may not be experiencing pleasure at all during exposure to art, but is nevertheless constrained to respond in those terms.

Fechner's method of selection thus continues to cast a shadow over experimental aesthetics by promoting the notion that aesthetic response is a matter of stimulus preference. Preference, in turn, reflects a single underlying dimension of aesthetic response: pleasure. This conception results in highly constrained assessment of the appreciator's reactions. From our current vantage point, the unidimensional conception of aesthetic response studied by Fechner and Berlyne emphasizes a sense of missing tangibility in aesthetics from below. This approach precludes richly differentiated and complex accounts of aesthetic experience from the point of view of the art appreciator. In this way, the method of selection misses the mark in accounting for meaningful and integrative descriptions such as those provided by Wordsworth.

3. Implications of the preceding analyses

We have inherited a research tradition in experimental aesthetics that offers little explication of the lived complexity and poignancy of aesthetic experience. The general implication of these arguments is that experimental aesthetics will continue to play a marginal role in explicating aesthetic experience unless the field reorients around new conceptual and methodological tools.

On the stimulus side, the preceding arguments imply that we need to abandon the notion that abstracted and codified stimulus properties constitute a basic vocabulary of the beautiful. I propose that we should investigate reactions to art in its historical and cultural context and make fewer assumptions about what beauty is, in some transcendental sense. This suggests that meaningful study of art appreciation begins with actual artworks instantiating contingent stylistic practices. For example, we should study reactions to music conceived not as values on some 'uncertainty' dimension but rather as reflective of meaningful stylistic practices (e.g., tonal vs. atonal music). And, we should study reactions to painting conceived not as a collection of informational elements but rather as reflective of the painter's use of contingent stylistic practices to express meanings via colour and form.

The preceding arguments also imply that we should loosen our grip on the notion that stimulus parameters are the sole causal agents governing aesthetic response. I advocate a different focus wherein we consider the appreciator as an active participant in the constitution of aesthetic experience. A meaningful study of art appreciation should seriously consider the possibility that an artistic stimulus is not conceived in the same way for every appreciator. Context and individual differences play key roles in the constitution of aesthetic experience, and need to be included in our theories.

On the response side, the preceding analyses suggest that we need to abandon a unidimensional conception of aesthetic response in terms of pleasure. Moments of aesthetic experience may indeed be characterized by pleasure, but other aspects of meaning deserve to have a place in a full explication of the phenomenon. In order to more appropriately capture the full complexity meanings experienced during aesthetic experience, I advocate a return to a wide variety of assessment techniques. The common link uniting these assessments must be a concern for consciously experienced meaning from the point of view of the art appreciator. This implies a that psychological aesthetics should seek systematic descriptions of moments of aesthetic experience, and this goal is consistent with a phenomenological perspective on psychological phenomena (Giorgi, 1985; Kuiken, Schopflocher, & Wild, 1989).

The preceding arguments also imply that we should turn our attention to the constitution and integration of meaning in human experience as a central topic of interest in psychological aesthetics, as implied by Wordsworth. By more precisely characterizing how people have capacities to endow their worlds with meaning, we will move beyond the passive, stimulus-governed account offered by aesthetics from below. In essence, I am arguing for an experience-dependent conception of aesthetic response that acknowledges the constitution and integration of meaning by the human organism. Let us reorient experimental aesthetics by attending to the richly integrated and meaningful phenomenon of interest to Wordsworth.

Chapter II
A Cognitive Theory of Organsimic Context and Meaning Ascription

A. Prelude: Cognitive Science and the Search for Meaning

The last thirty years of psychological theory and research have witnessed a shift from behaviourist to cognitivist paradigms. One might think that this transition would help experimental aesthetics by providing new tools with which to formulate an experience-dependent conception of aesthetic response that explicates the phenomenon in its integrative complexity. However, theories of cognition have yet to develop a compelling account of the relationship between cognitive processes and conscious awareness.[11] This calls into question the relevance of cognitive science for the development of an experience-dependent theory of aesthetic response.

Consider Pylyshyn's (1984) proposal that a complete account of cognition requires descriptions at three levels of analysis. At the level of implementation, cognitive scientists describe the 'functional architecture' of thought by explicating the 'hardware' underlying cognition (i.e., cognition's physical substrate, conceived physiologically or mechanically). At the level of the computational algorithm, investigators describe symbol systems, their structural features, and rules for symbol combination, i.e., the 'software' underlying cognition. Finally, at the level of meaning or semantics, investigators explicate meanings which are preserved by the functional architecture and computational algorithms during cognition (e.g., the cognitive system is 'performing addition', or 'making a deductive inference', 'judging whether a sentence is grammatical', etc.).

One might think that conscious awareness is situated at the semantic level of analysis in this framework. However, although "...it is ... the environment or antecedent event as seen or interpreted by the subject, rather than described by physics, that is the systematic determiner of actions" (Pylyshyn, 1984, p. 9, italics in original), "...we have no right to the a priori assumption that the set of conscious contents is a natural domain" [of inquiry for cognitive science] (Pylyshyn, 1984, p. 265).[12] How do theorists such as Fodor and Pylyshyn justify this stance? One account is that investigators have preferred to explicate symbol systems

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11. Dennett states that "...cognitive psychologists have skirted the domain of consciousness by so wide a margin that they offer almost no suggestions about what the "interface" between the models of cognitive psychology and a theory of consciousness should be" (1978, p. 149). One exception to this trend is Jackendoff's (1983; 1987) theory of cognition, which is considered later in this chapter.

12. Fodor (1975, ch. 1) similarly endorses the view that conscious contents do not form a coherent domain of inquiry in cognitive studies.

and algorithms over research practices designed to describe meanings in conscious awareness. This preference follows from the position that conscious contents do not form a coherent domain of inquiry for cognitive studies. When representational tokens in a symbol system are given priority in theory and research, there is no need for systematic description of conscious contents; instead, investigators try to describe computational relations obtaining among symbol tokens and types. Thus, cognitive scientists such as Pylyshyn and Fodor give priority to the symbol level of description in their theories.

The assumption that conscious contents do not form a coherent domain of inquiry corresponds to naive phenomenology in research practice. Specifically, the referents of symbol systems are assumed to be unproblematic and not in need of systematic description by cognitive scientists.[13] Cognitive scientists have thus preferred to presuppose meanings preserved by computational algorithms, instead of explicating meaning ascription processes and their relationship to conscious awareness.[14]

Importantly, the primacy of the symbol level in cognitive science parallels the primacy of codified stimulus properties in experimental aesthetics. Both domains posit a priori and perhaps innate parameters within which phenomena of interest operate. These codified parameters are thought to be so fundamental that cognition or aesthetic response merely 'runs off', given appropriate input conditions and/or appropriate algorithms. If we respond to music by possessing an innate set of rules of European tonality and harmony, then we similarly possess an innate language of thought that underlies all meaningful reasoning, problem-solving, categorization, and so on.

The present theory, in contrast, provides a framework for studies of meaning ascription and conscious awareness. On the current theory, constitution of meaning is not the application of codified symbols or stimulus parameters designed to 'guarantee' appropriate (e.g., meaningful, pleasurable) responses, given some input domain and appropriate algorithms. Rather, meaning ascription processes are viewed as creative constructions of a conscious organism. I acknowledge that people are endowed with a limited set of cognitive operations and biologically determined primitive

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13. For example, studies of mathematical cognition typically do not explicate the meaning of 'division' per se but instead implement symbol systems and algorithms designed to preserve semantic relations, such as relations between the divisor and dividend. The referents of these terms are apparently 'transparent' and unproblematic.

14. Computational symbol systems preserve regularities in meaning as these are found in a semantic description of input-output regularities expressed in 'ordinary language' (cf. Pylyshyn, 1984, p. 33; Dennett, 1969, p. 80). These semantic regularities are then assumed to be aspects of conscious experience for the cognizer (e.g., Fodor, 1987, ch. 1). A phenomenological approach to this issue presupposes inquiry directed toward the description of the meaning of the input-output regularities under investigation.

representations, but these do not predetermine the process of meaning ascription. Instead, people bring a wide range of individual differences in knowledge and skills to bear during the meaning ascription process. By emphasizing the content of conscious awareness in the study of meaning ascription, we may be able to salvage Wordsworth's integrative account of aesthetic experience. We may also be able to articulate how cognition transcends application of codified symbols and rules in the creation of meaning.

B. Theoretical Orientation: Organismic Context

The term organismic context is used to describe two cognitive capabilities that humans possess: (1) a set of general perceptual/cognitive processes, and (2) conceptual structure, a primitive level of mental representation that allows for characterization of entities across sensory modalities and domains.[15] These two elements of organismic context are viewed as the source underlying the creation and integration of meanings for conscious awareness.

General Cognitive Processes: Ascription of meaning in conscious awareness depends not on the 'sensitivity' of the perceptual/cognitive system to codified stylistic conventions or stimulus parameters, but rather on a set of general processes inherent in the production and appreciation of visual, auditory, and kinaesthetic symbols. Similarly, meaning ascription depends not on application of a priori symbol systems and predetermined rules for their combination, but rather on a set of general processes that underlie creation and integration of meanings.

What are some examples of general cognitive processes that underlie consciously experienced meanings? Serafine (1983) outlines three general perceptual-cognitive processes involved in the appreciation and production of music that provide a starting point. These processes include (1) field definition (e.g., identifying ambient sounds as musically intelligible; differentiating a melody as figure relative to a background of harmony), (2) temporal organization (e.g., discrimination of event-to-event musical phenomena such as phrases and themes), and (3) nontemporal operations (e.g., recognizing a musical theme in a different key; apprehending the referential meaning of music).

Serafine's conception is useful because it specifies general cognitive processes underlying responses to (and production of) music that are not linked to prior, codified conceptions of artistic style. Instead, field definition, temporal organization, and nontemporal operations are utilized across a variety of musical styles. Nor are these

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15. The term 'cross-modal' refers to input received from different senses (e.g., vision vs. hearing), whereas the term 'cross-domain' refers to input-independent modalities (e.g., remembering vs. imagining)

processes constrained by prior conceptions of symbol manipulation. These general cognitive processes are regarded as partially constitutive of musical styles during composition, and as partially constitutive of meaningful reactions during musical appreciation. Also, Serafine's general cognitive processes are useful because they have clear relations to the composer's or appreciator's conscious experience of music.

The limitation of Serafine's conception is that it is refers exclusively to the auditory domain. Owing to present interests in the integrative nature of cognition, it will be useful to explicate an analagous conception of general cognitive processes that guide cross-modal and cross-domain ascription of meaning.

Conceptual Structure: Jackendoff (1983) proposes that humans are endowed with a single level of mental representation, conceptual structure, at which cross-modal and cross-domain information is compatible. The conceptual structure hypothesis proposes that a set of representational primitives, in part, allows us to characterize what we see, hear, feel, remember, and so on. These primitives consist of units such as things, places, and events for which type-token relations hold.[16] For example, when we individuate a visual object as a "painting" we can further conceptualize it as an "abstract painting", a "Pollock", and so on. Similarly, when we individuate sound as 'music', we can further conceptualize it as an "oboe concerto", an "adagio movement", and so on.

The conceptual structure hypothesis provides several advantages for a theory of the constitution and integration of meaning. First, primitive representational categories in conceptual structure are trans-stylistic in the sense that their derivation is not based on stylistic conventions. Second, representational primitives are cross-modal in the sense that they are utilized in the characterization of entities across sensory presentations. Finally, representational primitives exist in a common format such that integration of cross-modal and cross-domain cues is possible. In the present theory, then, representational primitives constituting conceptual structure are viewed as part of our biological inheritance. They are not culture-specific or learned aquisitions. These primitives serve to constrain possible meanings brought to conscious awareness. As such, conceptual structure functions to set more-or less consistent limits on what can be possibly meant.[17]

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16. Jackendoff (1987, ch. 8) views the type/token distinction as a primary differentiation in conceptual structure. This distinction is regarded as a basic aspect of categorization processes.

17. Of course, learning and cultural context also play a role in meaning ascription processes. The art expert, for example, has learned discriminations which allow highly differentiated meanings to be ascribed to artworks. And, different cultures may ascribe meaning to nature or art in ways that differ from other cultural groups. Nevertheless, the import of Jackendoff's (1983) claim is that in addition to a base of constantly changing knowledge, humans possess a biologically

In contrast to Jackendoff's naive-phenomenological perspective[18], I view representational primitives not as codified elements utilized by predetermined algorithms producing transparent and invariant meanings as 'output' but rather as constituents of the meaning ascription process itself. In the present theory, primitive meaning-elements of conceptual structure are recruited by a set of general cognitive processes such that contextualized meanings are presented in conscious awareness.

C. Postulates of the Theory

Given the preceding characterization of organismic context in terms of general cognitive processes and conceptual structure, three postulates about cognition form guiding themes for the present theory. As such, they also form research goals at Pylyshyn's (1984) semantic level of analysis.

Postulate 1. Cognition culminates (but does not terminate) in meanings provided to conscious awareness. From this proposition, a central research question is to explicate and systematically describe meanings presented to conscious awareness.

Postulate 2. Cognition is essentially integrative. That is, cognition involves the coordination and participation of sensory, and intersensory modalities (e.g., vision, audition, feeling, touch, and kinaesthesia), as well as imaginal and memorial processes. From this proposition, central research questions are to determine when and how integration of information occurs across modalities and domains, and to determine consequences of such integrative processes for conscious awareness.[19]

Postulate 3. Cognitive processes recruit representational primitives from conceptual structure, allowing for information integration across domains and modalities and the emergence of objects for conscious awareness. From this proposition, types of representational primitives need to be specified and their relations with general cognitive

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rooted, generic, cross-modal and cross-domain level of mental representation which is used, in part, to endow externally (e.g., sight, hearing) or internally (e.g., memorial) generated information with meaning.

18. For Jackendoff, the sole function of representational primitives is to support algorithmic symbol manipulation. Conceptual structure, on this view, has no linkage to conscious awareness. He is thus led to the position that ..."there are no causal connections from the phenomenological mind to the computational" (Jackendoff, 1987, p. 25).

19. The encapsulated view of perceptual 'modules' endorsed by Fodor (1983) appears inconsistent with the integrative postulate since it does not address how information from different sensory modalities is coordinated to deliver cross-modal meanings to conscious awareness.

processes underlying conscious awareness should be explicated.

When conscious awareness is made a central component of the study of the semantic level of analysis, phenomena highlighting the essentially integrative character of cognition are made salient. Consider an observer standing on the side of a hill, watching a bird fly toward him or her. From a phenomenal perspective, the meaning of the object in conscious awareness is a function of the integration of visual and auditory cues in a manner that individuates the percept as a black raven, making a distinctive sound.

It is useful to consider the meanings unfolding in the observer's awareness in terms of mental acts (Husserl, 1913/1962; Kuiken & Wild, 1988). A mental act may be schematically characterized as: 'O Ψ 's that p', where O refers to the cognizer, Ψ refers to the modality of the mental act (e.g., seeing, hearing, feeling, remembering, etc.), and p refers to the content of the mental act (e.g., 'that there is a black raven above me'). In this example, meanings in the observer's awareness can be characterized by a sequence of mental acts (e.g., 'O hears a cawing sound'; 'O sees an elongated black figure', and so on). Meaning ascription processes create and integrate information across visual, auditory, kinaesthetic, and memorial domains in order to present contextualized meanings to awareness during such mental acts (e.g., 'O conceives of a black raven above him'). I propose that a set of general cognitive processes utilize conceptual structure in order to structure individual mental acts, to give them content, and to structure relations among mental acts. But what specific representational primitives and general cognitive processes underlie the delivery of coherent entities to conscious awareness during mental acts?

D. Spatial, temporal, and expressive coherence

An additional component of the theory is that cognition implies explicit or implicit integration between three fundamental domains of meaning: spatial, temporal, and expressive.

In ascription of meaning to visual input, discrete entities in awareness are primarily based on spatial coherence. That is, entities for the viewer are founded upon distinct figures in the visual field of awareness. Gestalt principles of spatial organization indicate that several factors (e.g., similarity, proximity, continuation) affect the degree to which a figure retains its integrity in a static visual presentation (Arnheim, 1974).

In ascription of meaning to auditory input, discrete entities in awareness are primarily based on temporal coherence. For example, at very early stages of audition, pitch duration determines whether distinct pitches are

individuated as a single entity or multiple entities in the 'auditory stream' of the listener's conscious experience (cf. Bregman & Campbell, 1971; Bregman & Pinker, 1975; Dannenbring & Bregman, 1978). In the case of complex musical compositions, temporal coherence is preserved by particular musical parameters employed by the composer (e.g., rhythm, repetition of melodic and harmonic patterns).[20] In ascription of meaning to nonverbal gestures, expressive coherence is primarily based on kinaesthetic and tactile cues indicative of discrete expressive states (e.g., a form of crouching expressive of submission).[21]

Consistent with these domains of meaning, I propose that three classes of representational primitives are recruited during the meaning ascription process. These constituents reside in conceptual structure and are unavailable, in and of themselves, to conscious awareness:

1. [SPATIAL OBJECT]: An entity conceived in those aspects which posit its spatial coherence.
2. [TEMPORAL OBJECT]: An entity conceived in those aspects which posit its temporal coherence.
3. [EXPRESSIVE OBJECT]: An entity conceived in those aspects which posit its affective, kinaesthetic, and/or tactile coherence.

The term 'aspects' is to be understood as a general term covering input sensory modalities, kinesthesia, imagination, and memory.[22] Sometimes, we individuate[23] [OBJECTS] when they are sensuously presented to us, as is the case in ordinary seeing or hearing. At other times, we individuate [OBJECTS] by imagining or remembering coherent entitites. The notion of representational primitives in conceptual structure is such that compatibility of information across modalities and domains is at least as important as the source of an object's coherence.

These primitives of conceptual structure may be subsumed under the general type [OBJECT]. They form one class of primitive meanings brought to bear during meaning ascription processes. An important task for research at the semantic level of analysis is to systematically describe [OBJECTS]

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20. Note that Gestalt organizational principles are also likely to affect the temporal coherence of complex musical compositions. For example, the principles of continuation and common fate preserve the temporal identity of musical 'entities' (Erickson, 1982).

21. Spatial, temporal, and expressive coherence is not limited to visual, auditory, and kinaesthetic input modalities, respectively. A bird in flight, for example, is both spatially and temporally coherent as a function of vision and audition working cooperatively. Seen objects can change over time, and heard objects may be localized in space.

22. In Husserlian terms, an 'aspect' refers to the modality of a mental act (e.g., seeing, believing, hoping, etc.), and not its content (e.g., what is seen, believed, etc.; Husserl, 1913/1962).

23. An individuated [OBJECT] is understood as a consciously experienced entity, based on the manner in which the primitive representational [OBJECT] type is 'filled' by contextualized content.

individuated in conscious awareness. As well, we will need an account of how the [OBJECT] type in conceptual structure is 'filled' by general cognitive processes such that seen, heard, felt, imagined, and remembered contents are presented in awareness.[24]

In order to present individuated [SPATIAL, TEMPORAL, and/or EXPRESSIVE OBJECTS] to conscious awareness, conceptual structure must be utilized in a process of figure-ground differentiation wherein a 'field' for meaning ascription is provided. Thus, a spatially coherent pattern of color and form (in a visual presentation) or a temporally coherent sequence of pitch patterns (in an auditory presentation) demarcate aspects of the perceptual field as 'figures' in the awareness of the cognizer. Similarly, a specific pattern of kinaesthetic activity may demarcate and expressive 'field' of awareness.

Figure-ground differentiation is conceived as a set of relatively encapsulated processes involved in the constitution of distinct meanings in various modalities and domains. Figure-ground differentiation is therefore sensitive to the 'aspect' in which meaning is provided, whether through visual, auditory, kinaesthetic, or memorial routes. Differentiation of figures requires that conceptual structure be utilized such that [OBJECT] primitives are 'filled' by contents pertaining to the input domain.[25] Thus, individuation of [OBJECTS] is influenced by knowledge the cognizer brings to bear on the cognitive field demarcated via figure-ground differentiation processes. Thus, the observer knows that 'ravens' are a kind of black bird and further individuates the [SPATIAL OBJECT] in those terms.

If meaning ascription were solely a matter of figure-ground differentiation, we would experience modality and domain-specific meanings in isolated mental acts. But individuated [OBJECTS] are typically experienced in a fused manner across spatial, temporal, and expressive domains during cognition (Arnheim, 1949). Properties within these three domains can enhance an individuated object's coherence (e.g., a small black bird conceived as a raven versus a large black bird being conceived as a crow), but cross-modal and cross-domain integration of properties further individuate the meaning of [OBJECTS]. For example, when presented with a weeping willow tree, we typically do not individuate the visual object, the willow tree, and only subsequently the expressive object, passive hanging; our conscious experience

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24. Langer's (1942) conception is pertinent here: "An object is not a datum, but a form constructed by the sensitive and intelligent organ, a form which is at once an experienced individual thing, and a symbol for the concept of it, for this sort of thing" (p. 83, italics in original).

25. Simultaneous figure-ground differentiation processes occur can occur across modalities and domains. In the raven example, visual figure-ground differentiation individuates, a pattern of black colour and an elongated form as a 'figure'. At the same time, auditory figure-ground differentiation individuates a distinctive 'cawing' sound as a figure relative to ambient sounds.

is such that spatial and expressive properties are fused in the perception of the individuated object.

The preceding implies that a second general cognitive process is used during meaning ascription. Synaesthetic ascription refers to cross-modal and cross-domain integration of information at the level of conceptual structure. Thus, through figure-ground differentiation the visual system may identify a black elongated shape as a bird. The auditory system may simultaneously identify a distinct 'cawing' sound in the space above the observer. Each encapsulated process recruits a [SPATIAL OBJECT] from conceptual structure, and it is through synaesthetic ascription that the visual and auditory aspects of the stimulus are integrated. If the bird suddenly swoops down toward the visual horizon, an [EXPRESSIVE OBJECT] is recruited from conceptual structure as the observer apprehends the fast descent of the entity. The swooping movement shares expressive features associated with affective states such as excitement and fear, which are further integrated by synaesthetic ascription processes such that spatial and expressive meanings are fused in the observer's awareness.

Now, if meaning ascription were only a matter of figure-ground differentiation and synaesthetic ascription recruiting [OBJECTS] from conceptual structure, we would experience entities during isolated mental acts in the 'fused' manner indicated above. But we would not be able to structure a sequence of mental acts in which entities are further individuated and related to other entities. Therefore, in addition to [OBJECTS], I propose that another class of representational primitives is utilized by general cognitive processes during meaning ascription:

> 4. [HORIZONAL MEANING]: Conceptually and metaphorically similar meanings. [INTERNAL HORIZONAL PREDICATIONS] further individuate or specify the kind of [OBJECT] being entertained by individuating more of its properties, while [EXTERNAL HORIZONAL PREDICATIONS] further individuate an entities' meaning by prescribing relationships between it and other entities (Kuiken & Wild, 1988).

In order to present individuated [HORIZONAL MEANINGS] to conscious awareness, conceptual structure must be utilized in a process of conceptual and metaphoric elaboration. When an [OBJECT] is individuated for the perceiver during meaning ascription, this entity can be elaborated in subsequent mental acts in one of two ways. First, [INTERNAL HORIZONAL PREDICATES] further individuate the kind of [OBJECT] the cognizer conceives the entity to be. For instance, when apprehending the bird as it approaches, one may note further properties internal to the entity itself, i.e., its size,

black markings, wingspan, and its beak, which allow further individuation of the object as an eagle and not, as was first thought, a raven. In this case, conceptual elaborative processes underlie subsequent mental acts and further individuate the object by specifying additional features and their classification.

Second, [EXTERNAL HORIZONAL PREDICATES] further individuate the entity by relating previously-individuated [OBJECTS] to other entities. For example, after watching the bird swoop down doward the visual horizon, the observer may further individuate the entity by conceiving a correspondence between the swooping movement and a swan dive. By conceiving of such a correspondence, the black raven is further individuated as a 'graceful diver' In this case, metaphoric elaborative processes underlie subsequent mental acts and further individuate the object by conceiving of correspondences between the individuated object and other entities. Elaborative processes such as these indicate that memory and imagination play an important role in meaning ascription processes during cognition. In particular, memory and imagination function, in subsequent mental acts, to further individuate and contextualize the perceived object in a particular 'world'.

To summarize, I have proposed that two classes of representational primitives ([OBJECTS] and [HORIZONAL MEANINGS]) interact with incoming information and prior knowledge in order to present individuated meanings to conscious awareness during contemplation of visual and auditory artworks. In order to accomplish this task, I have proposed three associated cognitive processes (figure-ground differentiation, synaesthetic ascription, conceptual-metaphoric elaboration) which underlie the mental acts providing meanings to conscious awareness.

Chapter III. Organismic Context and Aesthetic Experience

The preceding chapter outlined a theory of the organismic context of cognition that relied on two interrelated notions. First, we are endowed with a set of spatial, temporal, and expressive representational primitives in conceptual structure; these provide the 'building blocks' of consciously experienced meaning. Second, we are endowed with a set of cognitive processes which recruit representational primitives in conjunction with world knowledge to present contextualized meanings to conscious awareness. These notions suggest that cognition is essentially an integrative process, and the theory is intended to apply to cognition conceived in its broadest sense, i.e., perceiving, thinking, remembering, imagining, etc.

But what of aesthetic experience, exceptional moments that fully engage vision, audition, and bodily feeling in a way that enlivens and deepens our experience of the world? The present theory, I argue, can accommodate these moments. But in order to do so, we must link the theory (1) to the role of individual differences in cognitive processes, and (2) to the role of environmental context in aesthetic contemplation.

A. Characteristics of Aesthetic Experience

Art is a powerful and pervasive form of human expression because it provides opportunities for deepened and enriched experiences of meaning. Indeed, great works of art are structured in such a manner so that a seemingly infinite variety of spatial, temporal, and expressive correspondences are revealed through their contemplation. In order to apply the theory of organismic context to aesthetic experience, we now need to be more precise about characteristics of the phenomenon for which we seek an account.

In addition to Wordsworth's poetic account, there are several traditions in the philosophical literature that provide hints about the nature of aesthetic experience. Goodman (1978), for instance, discusses deepening of meaning in aesthetic experience in terms of relative repleteness, in which relatively many aspects or features of a symbol or object are presented as significant in awareness. Goodman also refers to multiple and complex reference, in which the contemplated object performs several integrated and interacting referential functions, 'pointing to' numerous, varied meanings suggested by the object. Unfortunately, although Goodman (1978) regards these characteristics as two important 'symptoms' of the aesthetic, he provides us with no account of how appreciators attain awareness of an object's repleteness or of its multiple referential functions. In other words, Goodman's account describes attributes of

deepened and enriched meaning, but does not tell us what factors facilitate this process.

This position is similar to Dewey's (1934) differentiation between ordinary experience and an experience. For Dewey, conscious experience occurs continuously as a function of the organism's interaction with the environment. However, having an experience entails a sense of vital involvement and a clear demarcation from mundane awareness such that we are led to regard the experience as having a sense of coherence and completeness on its own. This suggests that aesthetic experience has a sense of coherence that sets it apart from ordinary forms of experience. And, Dewey's perspective is suggestive of the vital, felt involvement that can occur in moments of aesthetic experience. But, as with Goodman's account, Dewey describes characteristics of art as an experience without providing us with clues for its emergence.

Following Wordsworth, Goodman, and Dewey, I suggest that aesthetic experience is an especially acute case of integrative processes operating during cognition. One consequence of such heightened integration is enhanced within-modality individuation of [OBJECTS] suggesting multiple and complex referents. In contrast to mundane cognition, in which an individuated [OBJECT] possesses a single meaning or comparatively few meanings, the art object is richly individuated within modalities in a manner that presents many meanings to the appreciator; the seen or heard entity is literally 'pregnant' with multiple referents that can be integrated into a coherent unity. Another consequence of such heightened integration is enhanced cross-modality and cross-domain individuation of [OBJECTS]. In contrast to mundane cognition, in which meanings are encapsulated within modalities, the art object is richly individuated across modalities and domains in a manner that deepens experienced meaning. For example, ordinary cognition often does not possess a bodily felt character, but seen and heard aesthetic experiences can become infused with expressive meanings via integrative processes. These points suggest that in aesthetic experience, representational primitives and general cognitive processes are utilized and therefore such moments are continuous with episodes of mundane cognition. The transition from mundane to aesthetic experience is facilitated by integrative processes which deepen experienced meaning and lend a vital, bodily felt character, which enriches the appreciator's awareness.

Aesthetic experience, in this sense, is not easily studied nor easily induced. We must therefore examine the roles of individual differences and the context of aesthetic contemplation in order to hypothesize more precisely about when such transitions from mundane to aesthetic experience occur.

B. The Role of Individual Differences

The representational primitives and cognitive processes outlined in the previous chapter do not guarantee that similar meanings will be presented to conscious awareness during cognition and art contemplation. This is so because of a number of factors. First, people differ in artistic knowledge, training, and interests. Practicing artists, for example, have learned to make fine discriminations among aesthetic media that might be expected to facilitate and enhance cross-modal integrative processes during contemplation of art, relative to nonartists. Artists might therefore be particularly prone to experience bodily felt reactions and cross-modal correspondences during aesthetic contemplation. In addition, artistic training and interests can also be expected to influence the ability to individuate objects of awareness within modalities during aesthetic contemplation. The art historian has acquired many stylistic concepts and has learned a specialized vocabulary with which to characterize art; these factors can be expected to facilitate the generation of multiple and complex referents during individuation of objects in aesthetic contemplation.

Although individual differences in artistic training, aesthetic interests and artistic knowledge can be expected to enhance integrative processes during aesthetic contemplation, there may be general individual differences in integrative cognitive processes that are evidenced by people who may not have had significant artistic training. People may differ, for example, in the individuation of multiple and complex referents during object contemplation, and in the ease and reliability with which they are able to perform cross-domain and cross-modal integration of properties. One individual difference that is relevant in this respect is absorption, defined as openness to absorbing and self-altering experiences (Tellegen & Atkinson, 1974). High-absorption individuals appear to be predisposed to episodes in which attention is totally devoted to modelling and experiencing objects, including mundane perceptual objects, oneself, or natural and cultural phenomena.

Several studies indicate that absorption moderates variability with which people execute the general cognitive processes outlined in the present theory. Wild (1986) presented evidence that absorption is positively related to the clarity and vividness with which a painting is perceived. Baum and Lynn (1981) found that absorption is positively related to 'involvement' in reading. Rhodes et. al (1988) reported that high absorption individuals preferred abstract paintings to a greater extent than representational paintings. Crawford (1982) found that absorption is positively related to efficient closure in figure-ground differentiation tasks. Finally, Rader and Tellegen (1987) reported that absorption is positively correlated (.40) with

the ability to experience cross-modal, synaesthetic meanings in response to music.

In the present context, absorption is proposed to facilitate integration between spatial, temporal, and expressive domains of meaning during cognition. Tellegen and Atkinson (1974) describe absorption as the ability to ..."operate diverse representational modalities synergistically so that a full but unified experience is realized" (p. 275). If high-absorption people are indeed predisposed to apprehend cross-modality and cross-domain integration among spatial, temporal, and expressive sources of coherence in cognition, this facility may result in multiple, complex reference during object individuation, and in enhanced expressive involvement during art contemplation generally.

However, a limitation of the absorption construct is that its status as a trait remains unclear. One possibility is that it represents an innate source of cognitive integration. Another possibility is that the 'synergistic' skill evidenced by high-absorption people develops systematically as a function of the type of cross-domain and cross-modality training that is found in artistic pursuits. On the first account, art training and absorption represent separate influences on integrative processes during art contemplation, i.e., art training reflects an acquired source of integrative cognitive skills whereas absorption reflects an innate source of integrative cognitive skills. On the second account, the two factors are systematically related such that high-absorption people are predisposed and motivated to engage in aesthetic activities, which provide an ideal outlet for their natural integrative cognitive capacities and further enhance them. In order to disentangle these possibilities it appears important to empirically determine relationships between artistic training and absorption in order to precisely explicate sources of individual differences in integrative cognitive capacities. If such relationships have been established, we can then proceed to examine art training, absorption, and processes of (1) figure-ground differentiation, (2) synaesthetic ascription, and (3) conceptual-metaphoric elaboration. To the extent that artistic training and absorption jointly or separately moderate multiple and complex reference within modalities and enhanced cross-modal and cross-domain ascription of meanings, these factors can be considered additional sources of organismic context that potentially deepen and enrich conscious experience during contemplation of art.

C. Musical Context and Aesthetic Contemplation

In addition to the role of individual differences in the promotion of aesthetic experience, the environment in which

the art appreciator finds him/herself provides an additional source of context which can affect the emergence of aesthetic experience (e.g., Appleton, 1975). The present research proposes to examine musical context as an influence on meaning ascription during contemplation of a painting. Musical context is an especially appropriate topic for a consideration of meaning ascription processes in visual art because of traditional concerns in theories of perception regarding the unity of the senses (cf. Marks, 1978; Werner & Kaplan, 1963). As well, it may be that musical context can enhance and deepen consciously experienced meaning of a visual artwork.

Research concerning cross-modal perceptual effects has sought to demonstrate that regardless of input sensory modality, people experience commonalities in presented meanings of perceptual objects. For example, Lindauer, Stergiou, and Penn (1986 a, b) found high positive correlations between tactile ratings and visual ratings of objects in terms of their connotative meanings. An object comprised of rough edges is experienced by people as embodying a certain jagged texture that is similar across tactile and visual domains. Indeed, we often respond to artworks in both visual and auditory modalities by ascribing similar meanings. For instance, when presented with atonal music, we may conceive of it as "harsh and lacking in balance"; similar meanings may accrue to an abstract expressionist painting.

A growing number of investigations have been concerned with explicating how artistic presentations to one sensory modality (e.g., music) affect meaning-ascription processes toward artistic presentations in another modality (e.g., paintings). Two studies (Minnigerode, Ciancio, & Sharboro, 1976; Wehner, 1966) required people to match paintings by Paul Klee to musical compositions that inspired the painter, demonstrating that art appreciators can, to a limited degree, apprehend commonalities between musical and visual presentations. Parrott (1982) examined effects of musical selections on affective ratings toward 20th century paintings. His investigation suggested that emotional effects of music and paintings are additive given conjoint presentations of stimuli. Simon and Wohlwill (1968) reported that participants exhibit agreement between choice of visual patterns and musical selections designed to represent the patterns.[26]

Such cross-modal correspondences naturally lead to questions regarding the basis upon which visual and auditory artistic presentations are ascribed with similar meanings

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26. Other studies have examined influences of sounds on perception of apparent motion (Staal & Donderi, 1983), on perception of the rat-man ambiguous figure (Liu, 1976), and on attributions toward entities presented in films (Marshall & Cohen, 1988). In all cases, auditory presentations have been found to have cross-modal effects on the meanings attributed to visual presentations.

during art contemplation. Lindner and Hynan (1987) provided evidence supporting the hypothesis that varying musical parameters, such as repetition, function to differentially highlight and disambiguate features of abstract visual art. This study utilized highly structured (minimalist) and unstructured (avant-garde) music in the context of a painting rating task. Lindner and Hynan found an effect of music type on painting ratings such that when abstract visual artworks were viewed with minimalist music, they were perceived as more controlled and orderly than with avant-garde music. This study provides preliminary evidence that music functions to set a more-or-less structured environmental context which differentially influences meanings ascribed to ambiguous paintings.

The present research proposes to extend Lindner and Hynan's (1987) preliminary research in line with the theory of cognition developed above. The working account is that, because representational primitives in conceptual structure are cross-modal elements of mental representation, prior exposure to music varying in structural properties may differentially influence expectations for compatible meanings to be entertained in the visual domain. For example, hearing the melodious rise, fall, and repetition present in Beethoven's Symphony #6 (Pastorale), one may be concurrently inclined to attend to the contour of a natural environment, or landscape painting. Or, the sweeping, pulsing texture of the Pastorale Symphony individuated for the music appreciator may suggest a imaginal reverie in which rolling foothills are individuated and imagined.

In proposing correspondences between properties of music and meanings entertained in the visual arts, a crucial issue is to more precisely specify the musical styles or properties thought to affect contemplation of a visual artwork. In line with the preceding arguments concerning the importance of studying relations between contingent stylistic practices and people's response to those practices, I sought to use musical stimuli varying greatly in terms of historically and culturally situated style. One such differentiation was to compare <u>tonal</u> music which employed <u>repetition</u> structure, i.e., familiar European classical music such as Beethoven, with <u>atonal</u> music which employed <u>random</u> structure, such as the "chance" music of Cage.

What meanings can be ascribed to these extreme cases of musical composition, and how might these be related to changes in meaning ascription during visual artistic presentations? When presented with tonal, repetitively structured music, it is likely that a number of discrete objects will be individuated for conscious awareness (e.g., in the case of Beethoven, a set of different themes in particular harmonic relations with each other). Melodic and harmonic repetition, elaboration, and embellishment implies relationships among distinct objects, which in turn may lend

the musical composition a distinct expressive object (e.g., in Beethoven, a sense of order, progression, and interconnectedness), which may suggest external horizonal predicates (e.g., contemplation of mathematical order). These individuated meanings may lead to similar individuation and contextualization of meanings in the visual domain (e.g., perceiving the quietude and order of geometrically-based paintings such as the works of Kandinsky).

Conversely, when presented with atonal, randomly structured music, the appreciator may not individuate discrete objects aside from pitches as differentiated from ambient sounds; the individuated objects presented for conscious awareness may only consist of isolated pitches. Melodic and harmonic randomness may imply a distinct expressive object (e.g., chaos), which in turn may suggest external horizonal predicates embodying a sense of other-worldliness or alienation. These meanings may lead to similar individuation and contextualization of meanings in the visual domain (e.g., perceiving the alienating chaos of geometrically-based paintings such as the works of Kandinsky).

D. Hypotheses

The following experiment is an attempt to pay heed to the rich integrative character of aesthetic experience suggested by Wordsworth, Goodman, and Dewey. Experimental studies, reviewed above, suggest that cross-modal processes have reliable effects on meaning attribution, but to date we have no body of research which investigates these processes with regard to the differentiated, complex lived meanings that occur when people encounter art.

On the cognitive theory of meaning ascription provided above, and in consideration of the preceding comments regarding factors facilitating distinctly aesthetic experience, we can form a set of two interrelated hypotheses regarding context and meaning ascription processes during aesthetic contemplation.

Hypothesis 1: Artistic training and absorption will jointly predict reliable differences in figure-ground differentiation, synaesthetic ascription, and conceptual-metaphoric elaboration. Specifically, increases in artistic training and absorption will be associated with more efficient figure-ground differentiation, increased vividness and reliability of synaesthetic ascription, and increased ease of metaphoric elaboration. If this hypothesis receives empirical support, this would suggest that there are reliable individual differences in general meaning ascription processes underlying cognition. As well, support of the hypothesis would indicate that certain people are especially predisposed to engage these processes in order to experience deepened and enriched experience during cognition of art.

Hypothesis 2: During aesthetic contemplation, cross-modal effects of meaning ascription will be demonstrated. Specifically, listening to music of varying structure (i.e., music varying in tonality and repetition) will affect meanings attributed to an ambiguous visual artwork. Further, individual differences in organismic context will predict the extent to which such cross-modal effects occur. In particular, high-absorption participants with prior training in the arts should be especially affected by cross-modal aesthetic presentations, and should utilize their cognitive abilities in an enriched and deepened experience of the artworks.

Method

Overview of the Research

The first goal of the research was to assess individual differences in the organismic context for cognition (i.e., figure-ground differentiation, synaesthetic ascription and conceptual-metaphoric elaboration). Consistent with hypothesis 1, this part of the experiment sought to determine relationships between artistic training, absorption, (Tellegen & Atkinson, 1974) and these general cognitive processes.

The second goal of the research was to experimentally examine effects of individual differences in organismic context and type of music on meaning ascription during contemplation of a nonrepresentational painting. Consistent with hypothesis 2, it was predicted that meanings ascribed to music would transfer across sensory modalities and influence meanings ascribed to the painting. Further, cross-modality effects were predicted to be mediated by individual differences in the cognitive processes of interest. Consistent with prior emphasis on the role of conscious awareness in a meaningful experimental aesthetics, this portion of the experiment relied on an array of self-report measures to examine cross-modality effects on meaning ascription.

A variety of tasks were developed to evaluate the two hypotheses of interest, including an incomplete figures test, a test of colour-sound attributions, and a similie generation task. As well, participants provided open-ended descriptions of experience during an encounter with a painting and during a music listening task.

Participants

A total of 68 individuals (44 females and 24 males, with an average age of 22.4 years) participated in a two-session experiment. Fifty-nine (59) individuals participanted in partial fulfillment of an introductory psychology course requirement. These participants were pretested in group testing for scores on the Absorption Scale. In order to ensure diversity of art background in the final sample, 9 individuals volunteered for the project on the basis of informal solicitations in the Department of Fine Arts at the University of Alberta. This latter group of 9 consisted of practicing artists and students working toward a Bachelor's degree in Fine Arts.

Session 1

Apparatus and Materials

Primary materials for the first session included (1) a background questionnaire package consisting of a current psychological distress inventory, a form soliciting informed consent to proceed with the research, an Art Background Questionnaire, and (for the volunteers) the Tellegen Absorption Scale (see Appendix I for copies of the background

materials), (2) a colour reproducation of Paul Klee's Composition (1935, see Appendix II for a reproduction), (3) a Sony stereo cassette recorder and headphones, (4) one of 3 experimental tapes (described below), (5) a minicassette recorder, (6) a tape for recording subjects' free verbal reports, and (7) a set of incomplete figures (Street, 1931).

Procedure

Participants were individually escorted to a small experimental room which contained a table and two chairs. At that time, participants were informed of the general topic of the research, which was to "investigate how people respond to art". Participants were also told that in the first experimental session, the researchers were collecting background information on personality and art interest, and would be examining the effects of physical and mental relaxation on their responses to music and a painting.

Background Information. Following this introduction, participants completed the background questionnaire package.[27] None of the participants were experiencing sufficient psychological distress to warrant discontinuing the study, and each participant gave informed consent to proceed with the study. Following completion of the art background questionnaire (and, for the volunteer participants, the Absorption Scale), the researcher escorted the participant to a darkened, softly lighted adjoining room. This second experimental room containing a comfortable easy chair, the Klee reproduction and the cassette taperecorders.

Taped Instructions, Viewing the Painting, and Verbal Reports. Participants were seated in the easy chair and were told that the next portion of the session would be devoted to examination of the effects of physical and mental relaxation on reactions to a painting. Tape-recorded relaxation instructions were administered via headphones. Participants were also told that, after the physical and cognitive relaxation instructions, they would receive additional instructions to open a folder placed near the tape recorder and to view a painting. Following the viewing, participants would receive a cue to turn off the tape recorder and to record their reactions to the test painting on the minicassette recorder located on an adjoining table. At the conclusion of their verbal reports, participants were told to open the door and summon the researcher, who would continue with the remainder of the session. After pausing to answer questions, the researcher vacated the room and the participant played the tape recorded instructions.

All participants were randomly assigned to one of three conditions; atonal music, tonal music, or no music control. Each of these tapes began with a common 18 minute relaxation sequence, modelled after Gendlin (1981) and Kuiken, Carey,

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27. The background questionnaire package was presented first in order to avoid distortion of responses by the experimental procedures.

and Nielsen (1987). The physical relaxation portion of the tape consisted of a progressive relaxation sequence (i.e., tensing and relaxing arms, forehead and shoulders, back and stomach and noticing the difference felt between tensed and relaxed muscles; see Appendix III). The cognitive relaxation portion of the tape consisted of instructions to imagine personal problems or concerns as outside one's body, and to gain psychological distance from those problems or concerns (i.e., "Feel that problem or concern in the middle of your body"; "Now, imagine that problem or concern outside yourself for awhile. Imagine it on the floor, or even in another room. Notice the quiet, relaxed way you feel when you do this"; see Appendix III.)

Following the standardized relaxation instructions each tape presented different instructions, corresponding to three experimental conditions:

Tonal/Repetition: In one condition, participants were instructed to close their eyes and listen to a short musical selection. A four minute excerpt from Claude Debussy's L'Ile Joyeuse, a piano composition, was then played.[28]

Atonal/Random: In another condition, participants were instructed to close their eyes and listen to a short musical selection. A four minute excerpt from John Cage's Music of Changes, a piano composition, was then played.[29]

Control: In this condition, participants were instructed to close their eyes and concentrate on their breathing. A 3-minute period of silence was presented.

After three minutes of either the Debussy piece, the Cage piece, or silence, standardized instructions for all conditions were resumed. At this interval, participants received an electronically generated tone that was a cue to open the folder and view the Klee test painting. Then, the piano compositions or silence continued for a 1 minute period, after which another tone cued participants to close the folder containing the test painting and to report their reactions.

The tape recorded instructions encouraged participants to start the minicassette recorder and to describe in as much detail as possible, their reactions to the painting (e.g., "Please describe your experiences as you viewed the painting in as much detail as possible. Your reactions may include thoughts, feelings, or impressions about the painting itself or may include your general reactions to viewing the painting in this research setting. Whatever the case, please report

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28. Piano music was used across experimental conditions in this session so that effects of musical instrumentation on meanings ascribed to the painting would be minimized. All excerpts were recorded in stereo.

29. In pilot testing, 123 introductory psychology undergraduates rated the Debussy and Cage selections on a set of 9-point semantic differential scales. The Cage piece was rated as more random (vs. repetitive), noisy (vs. quiet), unpleasant (vs. pleasant), ugly (vs. beautiful), and boring (vs. interesting) than was the Debussy piece (all p's $< .001$). These results supported the validity of the tonal/repetition vs. atonal/random condition manipulation.

out loud your experiences in as much detail as possible. When you are finished with your report, turn the minicassette recorder off and open the door to let the researcher know that you are done"; see Appendix III). Immediately following the verbal report task, participants opened the door and informed the researcher that he/she was finished.

Reactions to the Relaxation Instructions, Music, and the Painting. The experimenter then escorted the participant to the first experimental room and provided him or her with three sets of questionnaire materials. The evaluation of the relaxation instructions consisted of a set of five items assessing physical and cognitive relaxation, as well as distraction during the tape recorded instructions (see Appendix IV).

The music and painting questionnaires were identical in format and consisted of (1) a request for an estimate of the amount of time elapsed for the music or painting presentation, (2) a scale assessing distraction during the music or painting presentation, (3) a scale assessing awareness of feelings during the music or painting presentation, (4) a set of 14 semantic differential rating scales pertaining to the artwork (i.e., boring-interesting, tranquil-tense, awful-nice, static-dynamic, quiet-noisy, repetitive-random, beautiful-ugly, subtle-bold, passive-active, worthless-valuable, weak-powerful, unpleasant-pleasant, mild-intense, dead-alive), (5) two scales assessing familiarity of the music or painting and its style, and (6) a scale assessing desire to see or hear the painting/music at greater length. Participants in the no music control condition completed only the questionnaires pertaining to the relaxation instructions and reactions to the painting.

After completion of the questionnaires, the researcher conducted an open-ended interview to test for hypothesis awareness. This probe include (1) questions regarding the perceived hypotheses and rationale of the experimental procedures in the session, and (2) an opportunity for subjects to elaborate or embellish their verbal reports of their experience of the painting (see Appendix IV).

Gestalt Closure Test. Next, participants completed a figure-ground differentiation task (Street, 1931), which consisted of presentation of 15 incomplete figures. Participants were instructed to tell the researcher what they thought each incomplete figure portrayed, as fast as they could do so. The researcher recorded the first response of the participant, as well as reaction times to generate the first response using a stopwatch. The first two stimuli were presented as practice items, and the researcher answered questions regarding the task following their completion.

Metaphor Generation Questionnaires. Finally, participants received an envelope containing the Similies Test (Schaefer, 1971, see Appendix V). Participants were instructed to complete the materials in the envelope at home

and return them to the experimenter for Session 2 of the study.

Session 2

Materials

The following sets of materials were prepared for administration in the second experimental session: (1) ten slide reproductions of abstract expressionist paintings[30], (2) a prepared tape recording consisting of (a) an excerpt from Erik Satie's Premiere Gymnopedie (Varsano, 1981), (b) a series of 6 taperecorded tones (2 each from low, medium, and high frequency ranges), and (3) a questionnaire booklet containing 11 colour terms and 6 entries for tone-colour ratings.

Procedure

Participants were individually escorted by the researcher to a first experimental room, which contained a table and two chairs The researcher collected the metaphor generation questionnaire materials and administered a brief introduction to the tasks in the second session of the study, including (in order) a painting description task, listening to a taperecorded musical selection, and making a set of colour judgements.

Painting Descriptions. In the first experimental task, participants were presented with 10 slide reproductions of abstract expressionist paintings. Each painting was rear-projected on to a screen located just in front of the table where the participant was seated. The screen's dimensions were approximately 3/4 m X 1/2 m. Each painting was displayed for 2 minutes, and a standard sequence of instructions was followed for each painting presentation. During the first 1-minute period, participants were instructed to generate object descriptions for the work (i.e., "write down as many words or phrases as you can indicating distinct objects, things, or events the painting represents or suggests to you").

For the second 1-minute period, participants were instructed to generate expressive or feeling descriptors for the work (i.e., "write down as many words or phrases as you can indicating distinct feelings, moods, or expressive qualities the painting represents or suggests to you").

Following the 2-minute viewing period, participants were asked to judge if the painting just seen was another example of the artist viewed in the first experimental session (i.e., if the current work was an additional example of Klee's work). As well, each work was rated on a set of five 9-point scales (vividness, interestingness, ambiguity, familiarity,

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30. The following works were used: Kandinsky, Composition (1911); Klee, Park of Idols (1939); Poliakoff, Composition Abstraite (1966); Esteve, Composition (1961); Klee, Pious Northern Landscape (1917); Miro, Pierrot le fou (1964); Klee, Side Panels for 'Anatomy of Aphrodite' (1915); DeKooning, Door to the River (na.); Francis, Hurrah for the Red, White, and Blue (1961); Klee, High Watchman (1940).

and pleasingness). A questionnaire booklet was prepared with a workspace for generating the object and feeling descriptions for each painting, as well as for the painting identification task and the set of five rating scales.

Synaesthesia Tasks. Next, participants were escorted into a second experimental room and were seated at a table. Participants then listened to a prepared tape consisting of (1) a 2-minute excerpt from Satie's Premiere Gymnopedie, and (2) a random sequence of 6 tones. Initially, the two minute Satie excerpt was presented, after which participants reported in on their experiences while hearing the music (i.e., "Please write down your experiences while hearing the music, in as much detail as possible. Your reactions may include thoughts and feelings about the music itself, or may include reactions to being in this research situation"; see Appendix VI). The researcher presented a form that included these instructions and a workspace for recording their reactions.

Participants then proceeded to a series of colour judgements, in which 6 tones were matched with colour words. All colour judgements required participants to assign 5 points to the 11 colour terms (in any combination) "in a manner that best describes the tone to you". Each of the 6 tones (2 each from low, medium, and high frequency ranges) were assigned colour ratings by participants (Rader & Tellegen, 1987).

Interview and Debriefing. After administration of the synaesthesia tests, participants were interviewed by the researcher about their reactions to the research project in general, and were provided a written debriefing (see Appendix VII).

Summary

Table 1 presents a synopsis of the tasks used in the experiment, and their relations to the central constructs and hypotheses of interest.

Table 1
Experimental Tasks, Constructs Assessed, and Hypotheses

Session	Task	Construct	Hypothesis
1	TAS Quest.	Absorption	1
1	ABQ Quest.	Art Background	1
1	Verbal Report	Art Experience	2
1	Music Quest.	Art Experience	2
1	Ptg. Quest.	Art Experience	2
1	Street Figures	Figure-Ground Differentiation	1
1	Similes	Metaphoric Elaboration	1
2	Painting Descriptions	Figure-Ground Differentiation	1
2	Music Descrip.	Synaesthesia	1
2	Tone-Colour Task	Synaesthesia	1

IV. Analyses and Results

A. Relations Between Art Background and Absorption

The first hypothesis of this study was that artistic training and absorption would reliably predict individual differences in figure-ground differentiation, synaesthetic ascription, and metaphoric elaboration. This hypothesis is consistent with the view that people differ in general resources for aesthetic experience, and that these differences are reflected in tasks assessing each of the three cognitive processes. As previously discussed, two patterns of individual differences are possible. First, art training and absorption may be systematically related, i.e., high absorption participants exhibit high levels of artistic training and interest in aesthetic activities. Second, absorption and art training may be unrelated and therefore exert separate effects on these general cognitive processes.

One approach to resolving these alternatives was to identify relatively homogeneous subgroups of participants based on absorption and art background, using cluster analysis techniques. Fifteen background variables were used as input to the CLUSTAN (Wishart, 1987) algorithms for analysis. These 15 variables were selected because they included each individual's absorption scale score, as well as 14 quantitative variables assessing general interest and training in the arts. These latter variables included: number of courses in art history and art appreciation, prior training in three artistic domains (visual arts, music, and literature), ratings of the importance of these arts to daily life, ratings of the ability of the three artistic domains to influence feelings, the number of times the individual visited galleries in the past year, number of novels and poems read in the previous year, cumulative minutes of music listened to per day, and the number of cultural events attended in an average month. Each of these fifteen variables was converted to a standard score. Then, squared Euclidean distances were computed as a measure of interparticipant similarity and as input to the clustering routines.

The clustering algorithm selected in the present analysis was Ward's method (Ward, 1963), due to its prevalent use in the cluster analysis literature (Wishart, 1987), as well as its demonstrated accuracy in resolving multivariate normal mixtures in simulation studies (Edelbrock, 1979; Blashfield, 1976). Ward's method consisted of a series of N to 1 iterations, where at each iteration, individuals (or previously-formed groups) are combined such that total within-group variance is minimized.

One problem in the cluster analysis literature is that there is no clear criterion for selecting the "correct" number of clusters for detailed study. In the present

analysis, several criteria supported selection of the three cluster solution for detailed analysis. First, Ward's method supplies changes of error estimation at each iteration of the procedure. Where discontinuity exists in increments of error variation as groupings become larger (i.e., when increases in error variation occur relative to earlier clusterings), within-cluster homogeneity is enhanced, i.e., the groupings are maximally homogeneous. In the present analysis, the greatest discontinuity in error estimation of all group fusions occured at the three-cluster solution. Second, pragmatic criteria supported examination of three clusters, since these groups yielded *N*'s (of 26, 28, and 14 participants, respectively) sufficiently large for subsequent inferential statistical procedures. Finally, the three cluster solution yielded a robust classification[31] that reliably differentiated the clusters along several hypothesized and theoretically meaningful dimensions.

A multivariate analysis of variance (MANOVA) was performed and revealed an overall effect of cluster membership on the background variables (Wilks' lambda = .0626, approximate $F(30, 102 = 10.19$, $p < .0001$). In order to more precisely differentiate among the three clusters, one-way analyses of variance (ANOVAs) were performed on the 15 input variables, with cluster membership as the blocking factor. These results are displayed in Table 2.

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31. The results of Ward's method were compared with other agglomerative clustering algorithms in order to determine convergence of results. An average linkage method resulted in a three cluster solution that reproduced 77% of the cluster assignments found using Ward's method. On that basis, the results of Ward's method were judged sufficiently robust for further statistical comparisons.

Table 2
Background Data: ANOVAs for the Three Cluster Solution.

Variable	Cluster Means 1 (n = 26)	2 (n = 28)	3 (n = 14)	F (2, 65)
Absorption	23.6_a	16.3_b	28.4_c	25.79**
Art History	0.08_a	0.25_a	3.00_b	15.74**
Gallery /yr.	1.31_a	0.93_a	4.86_b	5.38*
Ptg. Importance	3.39_a	2.96_a	6.50_b	25.80**
Ptg. Moods	5.23_a	3.96_b	7.64_c	23.22**
Vis. Art Expert	1.85_a	2.04_a	5.50_b	46.84**
Min./Day Music	150_a	62_b	166_a	10.03**
Mus. Importance	7.27_a	5.43_b	7.79_a	14.50**
Music Moods	8.04_a	6.00_b	8.14_a	20.49**
Music Expert	4.81_a	3.21_b	5.71_a	9.10**
Books /yr.	48.4_a	14.3_b	29.2	8.34**
Lit. Importance	7.39_a	4.68_b	6.86_a	16.92**
Lit. Moods	7.00_a	4.36_b	7.57_a	41.78**
Cult. Event /mo.	1.35_a	0.68_a	2.79_b	8.51**

Note. * = $p < .005$ ** = $p < .0001$. Means with different subscripts differ significantly at $p < .05$ by Neuman-Keuls pairwise comparisons.

Table 2 shows a coherent patterning of absorption and the art backgound variables based on cluster membership. Fourteen (14) of the 15 background variables reliably differentiated among the three clusters of participants (all F's (2, 65) > 5.37, $p < .005$).

Participants in cluster 2 may be referred to by the descriptive term '*culture-unabsorbed*'. In comparison with clusters 1 and 3, these 28 participants reported the lowest levels of art education, lowest attendance levels at cultural events, lowest rated importance of the visual arts, music, and literature to daily life, as well as the lowest reported effects of these arts on participants' feelings. This cluster additionally exhibited a low mean absorption scale score ($M = 16.3$).

In contrast, participants in cluster 3 may be referred to by the descriptive term '*culture-absorbed*'. In comparison with clusters 1 and 2, these 14 participants reported the highest levels of art education, highest attendance levels at cultural events, highest ratings of the importance of visual art, music, and literature to daily life, and the highest

reported effects of these arts on feelings. This cluster additionally exhibited a high mean absorption scale score (M = 28.4).[32]

Participants in cluster 1 were not as easily characterized on the basis of the background variables. In comparison with clusters 2 and 3, these individuals reported low levels of art education, intermediate levels of attendance at cultural events and intermediate ratings of painting and music importance to daily life. This cluster also exhibited an intermediate mean absorption scale score (M = 23.6). But these participants reported a greater number of minutes spent listening to music during an average day, and reported reading more literature during the past year, compared with clusters 2 and 3. This group is perhaps best characterized by the descriptive term 'entertainment culture'; despite high levels of music listening and reading of literature, these participants did not exhibit any proclivity to engage in formal art education, artistic training or to regularly attend to cultural events.[33]

Analysis of the background data thus indicated that three coherent patterns of training and interest in the arts and absorption scale scores best describe the present sample. These patterns were characterized as culture-unabsorbed, entertainment culture, and culture-absorbed. This analysis also suggested a systematic relationship between absorption and distinct patterns of involvement in artistic and art-appreciative activities. To more precisely test this notion, the distribution of absorption scale scores was independently divided into thirds (low, medium, and high scores) and was cross-classified against the groups revealed by the cluster analysis. These results are presented in Table 3.

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32. Of the 9 practicing artists and fine art students who volunteered for the study, 7 were classified in the culture-absorbed group.

33. An additional item on the Art Background Questionnaire asked if participants listened to music primarily as "background for doing something else" or as an activity in itself. Participants in cluster 1 tended to affirm that they listened to music as a background for other activities, perhaps by listening to walkmans or by playing music as a background context for work activities.

Table 3
Cross Classification of Absorption Scale Scores and 3 Clusters.

	Cluster		
	Culture Unabsorbed	Entertainment Culture	Culture Absorbed
Absorption			
Low	17	3	0
Medium	10	12	3
High	1	11	11

The chi-square statistic for this contingency arrangement was significant, χ^2 (4) = 34.2, $p < .0001$. Inspection of the cell frequencies in Table 3 indicates that 85 % of low absorption participants were members of the culture-unabsorbed cluster; none were members of the culture-absorbed group. Medium absorption participants appeared about equally in the culture-unabsorbed group (40 %) and in the entertainment culture group (48 %). Finally, high absorption participants appeared about equally in the entertainment culture group (47.8 %) and in the culture absorbed group (47.8 %).

The cell frequencies presented in Table 3 show that a 'culture-absorbed' pattern of involvement in art training, art education, and art appreciation was associated almost exclusively with high absorption scale scores. High levels of self-reported artistic training and aesthetic interests were not associated with medium and low absorption scores. Persons exhibiting medium and low levels of absorption reported being uninvolved in aesthetic activities or reported using aesthetic activities as forms of entertainment.

Hypothesis 1 proposed that people differ in their general resources for aesthetic experience, as assessed by art background, absorption, and performance on tasks tapping general cognitive processes underlying art appreciation. Given the evidence of a systematic relationship between absorption and artistic training and interests indicated by these analyses, it seemed essential to disentangle any effects of absorption on these tasks from effects of absorption <u>in conjunction</u> with high levels of aesthetic interest and training. An analytic distinction was therefore made between high absorption participants and high absorption

participants who reported a 'culture-absorbed' pattern of aesthetic activities. The 23 participants reporting absorption scale scores in the upper 1/3 of the distribution were therefore divided into a group appearing in the culture-absorbed cluster and all other high absorption participants.

Subsequent data analyses compared performance on various tasks tapping the three general cognitive processes across 4 groups of participants: low absorption (n = 20), medium absorption (n = 25), high absorption (n = 12), and high absorption in conjunction with significant aesthetic interests and prior training in the arts (n = 11).[34] Differences between these analyses would suggest differential patterns of responses on the cognitive tasks based on absorption and high levels of training and interest in the arts, as opposed to effects of absorption without artistic training and interest.

B. Hypothesis 1: Individual Differences in Organismic Context

The previous section demonstrated a reliable patterning of background data relating absorption to distinctive levels of involvement and interest in aesthetic activities, resulting in a four-group classification of the sample. The next set of analyses attempted to determine reliable differences between the four groups of participants with respect to the three general cognitive processes of interest: figure-ground differentiation, synaesthetic ascription, and metaphoric elaboration.

1. Figure-ground differentiation

Gestalt Closure Task: Data from the Street figures task was coded as follows. An accuracy measure was developed such that each participant received 2 points for a correct identification of an incomplete figure (based on the Street (1931) norms), 1 point for an incorrect identification of a figure, and 0 points for no response to the presented figure. Reaction times to participants' first responses were coded in seconds.

The 15 figures comprising Street's (1931) figure-ground differentiation task differ considerably with respect to difficulty. Based on the descriptive statistics, stimuli were divided into 'easy' and 'difficult' figures. Easy incomplete figures were defined as those correctly identified by 75% or greater of the sample (i.e., figures 1, 2, 3, 4, 5,

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34. An alternative partitioning of these data arranged participants into 5 groups: low absorption; medium absorption/culture unabsorbed; medium absorption/entertainment culture; high absorption/entertainment culture; and culture absorbed participants. All data analyses reported herein compared the 4 groups described above with this alternative 5-group classification of the sample. No differences emerged that modified any of the conclusions reached on the basis of the 4 group classification.

and 8), while difficult incomplete figures were defined as those correctly identified by less than 75% of the sample (i.e., figures 6, 7, 9, 10, 11, 12, 13, and 15).

Of interest were the following questions: did overall accuracy scores for easy and difficult figures systematically differ as a function of the low, medium, high, and high absorption-culture absorbed groups? Also, did reaction times for easy and difficult figures differ systematically as a function of group membership? A series of one-way analyses of variance (ANOVA) were performed on the accuracy measures and reaction time measures, blocking by the four groups of interest (low absorption, medium absorption, high absorption, and high absorption in conjunction with aesthetic training and interests).

Table 4
Street Figure Task: Absorption, Accuracy, and Reaction Times.

Variable	Absorption Groups			
	Low (n = 20)	Medium (n = 25)	High (n = 12)	High-Arts (n = 11)
Accuracy				
Easy	11.85	11.52	11.67	11.82
Difficult	10.80	12.28	12.33	12.46
Reaction Time				
Easy	1.83_a	2.29_b	1.44_c	1.38_c
Difficult	6.72_a	7.12_a	3.89_b	4.56

Notes. Means with different subscripts differ significantly at $p < .05$. Accuracy scores for easy incomplete figures calculated out of 12; accuracy scores for difficult incomplete figures calculated out of 18. Reaction times presented in seconds.

Table 4 shows that there were no accuracy differences among the absorption groups for either the easy incomplete figures ($F(3, 64) = 1.31$, ns.), or for the difficult incomplete figures, $F(3, 64) = 1.78$, ns.

When reaction times were compared, effects of absorption groups were indicated for both easy and difficult incomplete figures ($F(3, 64) = 2.85$, $p < .04$, and $F(3, 64) = 3.86$, $p < .01$, respectively). Fisher's protected t-tests showed that high absorption and high absorption-culture absorbed

participants exhibited reliably faster reaction times for the easy incomplete figures than both medium and low absorption participants ($p < .05$). Interestingly, for easy incomplete figures, medium absorption participants exhibited slower reaction times than the low absorption participants ($p < .05$). For the difficult incomplete figures, high-absorption participants responded faster than both the low and medium-absorption groups ($p < .05$).

Data for the Street Figures thus suggest that absorption per se mediates speed of reaction time during a figure-ground differentiation task.[35] These data support the notion that absorption influences how quickly participants are able to individuate percepts in conscious awareness on the basis of incomplete information. High absorption participants in general tend to quickly individuate figures in the visual domain compared to medium and low absorption participants.

Importantly, lack of differences between the high absorption and high absorption culture-absorbed groups suggests that significant training and interest in the arts provides no benefit with respect to immediacy of meaning attribution in a figure-ground differentiation task over and above that provided by high levels of absorption.

Painting Descriptions: Another measure of participants' ability to individuate objects in awareness was provided by analyzing written descriptions of objects, things, and events identified in response to a series of 10 abstract expressionist paintings presented in Session 2. This task differed from the Street Figure task in several respects. First, unlike the single-response format of the Street Figure task, participants were required to generate as many object, thing, or event descriptions as possible in response to one-minute viewings of the paintings. Second, there were no predetermined criteria for accuracy or correctness of participants' descriptions.

These points suggest that the painting description task assessed productivity of figure-ground differentiation, i.e., the ability to ascribe meaning to an ambiguous stimulus and then shift to reinterpret the stimulus by identifying additional objects or events. The notion of interpretive shifts in figure ground differentiation is consistent with Goodman's (1976) emphasis on multiple and complex reference as 'symptoms' of the aesthetic. To the extent that people are efficient and flexible in figure-ground differentiation, a large number and variety of object or event descriptors should be generated, indicating greater productivity during meaning ascription.

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35. A post-hoc ANOVA on average reaction times for the 15 figures, blocking by low, medium, and high absorption groups confirmed the general effect of absorption ($F(2, 65) = 6.07$, $p < .004$). Across the 15 figures, high absorption participants individuated the stimuli more quickly ($M = 3.09$ s) than both medium ($M = 5.19$ s) and low absorption participants ($M = 4.76$, $p < .05$ by Neuman-Keuls comparisons).

Initially, ratings of vividness, interestingness, ambiguity, familiarity, and pleasingness were tabulated for each of the 10 paintings. On the basis of these descriptive statistics, 2 test paintings were selected for detailed protocol analysis. These works were Kandinsky's Composition and Esteve's Composition, selected because they received the most divergent ratings of all paintings in the stimulus set. Across the sample, the Kandinsky was rated as more pleasing (M = 6.37), more interesting (M = 6.56), more vivid (M = 6.54) and less ambiguous (M = 4.90) than the Esteve (M's = 4.80, 4.87, 4.80, and 5.40, respectively). Of interest were potential differences in productivity of meaning ascription for paintings eliciting divergent reactions.

Participants' written protocols for each painting were transcribed verbatim and decomposed into single nouns, verbs, or noun/verb clauses. For example, participant 67 described the objects, things, and events attributed to Esteve's Composition as follows: "crowd; persons with arms extended; people embracing; textile patterns; shooting". Six distinct objects were attributed to the painting by this participant, indicated by six noun phrases: crowd, persons, arms extended, people embracing, textile patterns, and shooting.[36]

A series of 4 X 2 mixed-model ANOVAs (Low, Medium, High absorption, and High-Arts groups X Kandinsky and Esteve paintings), with repeated measures on the painting factor, were performed on the productivity measure, i.e., the total number of object descriptors provided during the viewing. There was no reliable absorption group X painting interaction for the variable, but there was a reliable within-subjects main effect of painting type on productivity, $F(1, 64) = 5.06$, $p < .02$, such that the Kandinsky elicited more object attributions (M = 4.94) than the Esteve (M = 4.21).

Analyses also revealed a between-subjects main effect of absorption groups on the productivity measure, $F(3, 64) = 9.14$, $p < .0001$). Low absorption participants attributed the least number of objects, things, and events, across paintings (M = 3.80), followed by medium absorption participants (M = 4.06), high absorption participants (M = 5.13), and high absorption-culture absorbed participants (M = 6.32). Fisher's protected t-tests showed that high absorption participants with significant interest and training in the arts 'saw more' objects, things and events than both medium and low-absorption participants ($p < .05$).

Summary: Two figure-ground differentiation tasks demonstrated reliable individual differences in this cognitive process as a function of absorption. The Street Figure data indicated that high-absorption participants are

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36. A judge, blind to both the hypotheses of the study and to absorption group assignments, rated 15 % of the written descriptions, drawn at random from the protocol set (n = 10; 5 each taken from the Kandinsky and Esteve protocols) for the total number of object descriptors. Correlations between the judge's ratings and the original scores indicated acceptable interrater reliability (r = .92).

in general faster at individuating a coherent visual figure on the basis of incomplete information, compared to medium and low absorption participants. This indicates that speed of meaning ascription differs reliably as a function of absorption. When the task was changed to include object or event attributions made to abstract expressionist paintings, high absorption participants who reported significant prior training and interest in the arts exhibited the greatest productivity in figure-ground differentiation, i.e., they reported "seeing more" objects, things, and events than the medium and low absorption participants. Although speed of figure-ground differentiation decreases with high levels of absorption per se, only those high absorption participants with prior training and interest in the arts demonstrated multiple and complex reference in figure-ground differentiation.

2. Synaesthetic Ascription

Several tasks were designed to assess individual differences in synaesthetic ascription. Following Rader and Tellegen (1987), these tasks were divided into two groups: (1) a set assessing synaesthetic translation skill, i.e., the ability to make colour-sound meaning ascriptions consistent with general world knowledge about associations between sound and colour, and (2) a set assessing synaesthetic experience, i.e., reported experiences of colour and/or visual imagery in response to auditory stimuli.

Synaesthetic Translation: Recall that participants provided colour attributions for a series of 6 tones (2 each from low, medium, and high frequency ranges) during session 2 of the experiment. These judgements required participants to assign 5 points to 11 colour terms in a manner that best characterized the tone. Initially, mean colour ratings for each of the 11 colours, for each of the 6 tones, were tabulated for the sample, in order to determine overall group regularities in synaesthetic translation.

FIGURE 1

Synaesthetic Translation

Group Norms

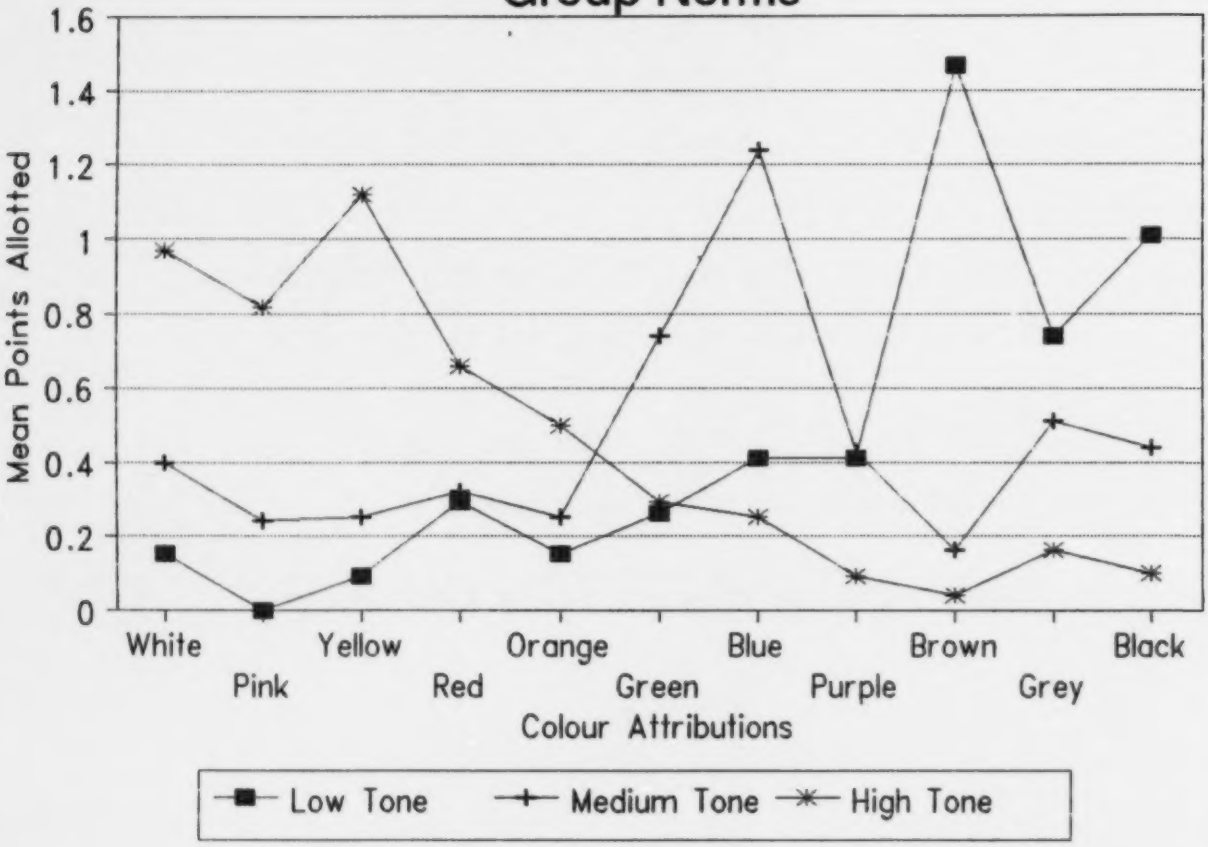
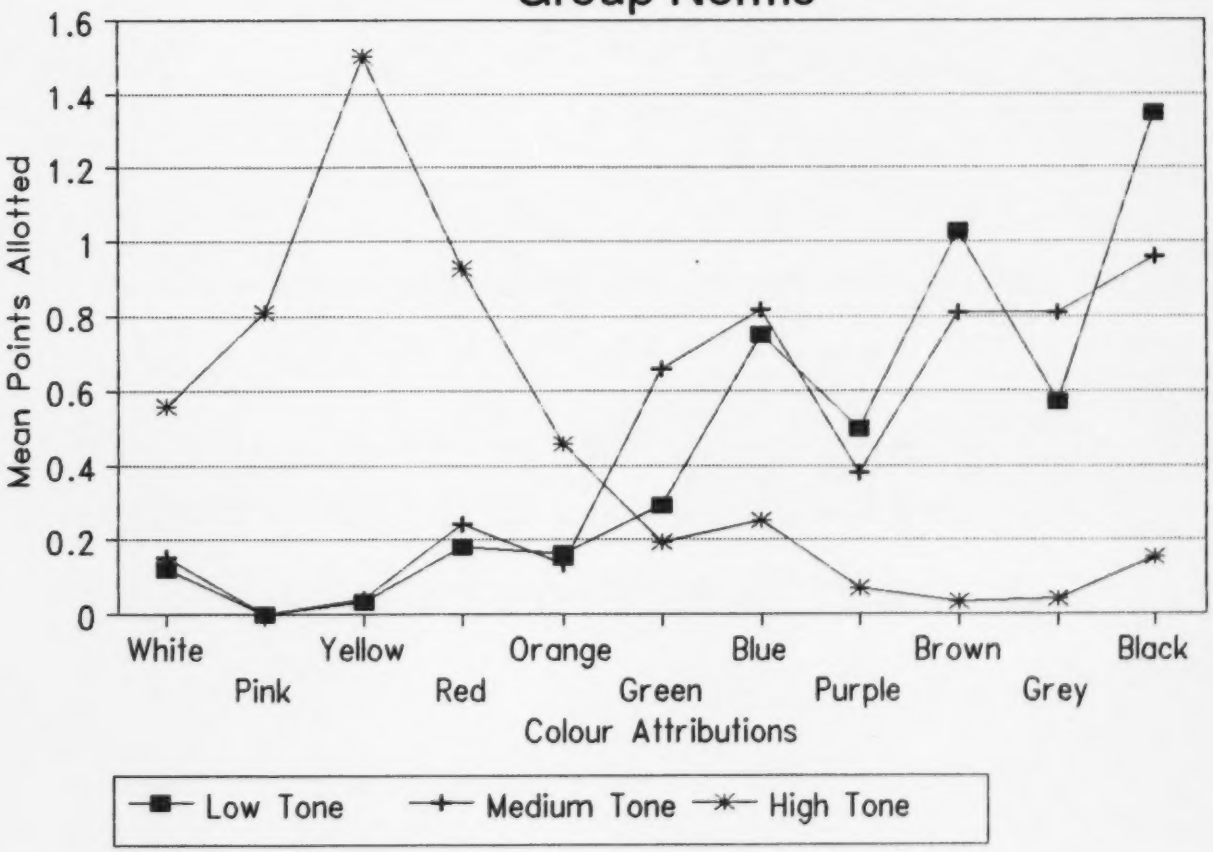


FIGURE 2

Synaesthetic Translation

Group Norms



Figures 1 and 2 show that for the sample as a whole, an orderly pattern of synaesthetic translation was observed. Participants ascribed white, yellow, and pink colours more frequently to high-frequency tones; low-frequency tones tended to be judged as brown, grey, and black. Medium-frequency tones tended to be judged as blue and green. This pattern of group results replicates Rader and Tellegen's (1987) original research using the tone-colour technique, and confirms psychophysical research on sound-colour associations (Marks, 1975).

In order to assess individual differences in synaesthetic translation skill, a composite measure of an individual's deviation from the group norms presented in Figures 1 and 2 was calculated as the absolute value[37] of an individual's colour judgement score minus the group mean for that tone and colour. These difference scores were summed across the 6 tones to yield a composite deviation score for each participant.

A one-way ANOVA on the composite deviation score indicated a main effect of absorption groups, $F(3, 64) = 2.92$, $p < .04$. Neuman-Keuls pairwise comparisons showed that high absorption participants who reported prior artistic training and aesthetic interests deviated less from the group norms for colour-tone attribution ($M = 38.1$), compared to low absorption participants ($M = 43.2$, $p < .05$). The deviation means for medium ($M = 41.4$) and high absorption ($M = 42.3$) participants did not differ from each other nor the other groups.

Thus, low absorption participants attributed colour to the tones in a more idiosyncratic manner, exhibiting less consistency with respect to the general sample's 'knowledge' of colour-sound associations, in comparison with high absorption participants with interests in the arts. These results suggest that synaesthetic translation skill is enhanced for high absorbers who take an active interest in aesthetic activities, whether by art training or attendance at cultural events.

Synaesthetic Experience: Two sources of data were provided regarding experiences of colours and visual imagery in response to auditory stimuli. First, following presentation of each of the 6 tones in the colour judgement task, participants were asked if they "saw colours", "thought about colours", and "felt like colours make them feel" (Rader & Tellegen, 1987). These three questions were also asked following a 2 minute listening to Satie's Premiere Gymnopedie.

A composite tone-synaesthetic experience score was calculated as the sum, over the 6 tones, of all of the "yes" responses for the "see", "think about", and "feel" responses

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37. For this analysis, magnitude of individual deviations relative to the group norms was of interest, not direction of these deviations.

on the checklist.[38] The same scoring system was used to derive a music synaesthesia score. Two one-way ANOVA's were performed on these measures, and both indicated a reliable effect of absorption groups on the checklist measures of synaesthetic experience ($F(3, 64) = 4.45$, $p < .007$ and $F(3, 64) = 3.01$, $p < .04$, for the tone and music synaesthesia measures, respectively).

Table 5
Absorption and Checklist Measures of Synaesthetic Experience.

	Absorption Groups			
Stimulus	Low	Medium	High	High-Arts
Tones	12.6_a	14.0_a	14.6_a	19.96_b
Music	1.5_a	1.8	2.3	3.1_b

Note. Means with different subscripts differ significantly at $p < .05$ by Neuman-Keuls pairwise comparisons.

Table 5 shows that high absorption participants with prior interest and training in the arts reported a greater level of synaesthetic experience in response to both the tone stimuli and the Satie piano music: they endorsed items reporting "seeing", "thinking about", and "feeling" colours to a greater degree than other groups of participants.[39]

A second source of data for participants' synaesthetic experience consisted of their free written descriptions of experience following a 2-minute listening to Satie's Premiere Gymnopedie. The 68 written protocols were transcribed verbatim for subsequent analyses. Three measures of synaesthetic experience were developed. First, the total number of distinct visual objects reported in the written accounts of music experience was tabulated for each participant, based on the occurrence of distinct nouns/noun phrases. Second, the total number of distinct feeling qualities reported in the written accounts was tabulated for each participant. Finally, a measure of vividness of synaesthetic experience was developed. Conceptually, this

38. One point was assigned for affirmative responses to the "think" and "feel" categories, and 2 points for the "see" category: ..."subjects endorsing the see category were credited with endorsing the think category because seeing was assumed to imply thinking" (Rader & Tellegen, 1987, p. 982).

39. Correlations were calculated between absorption scores and the checklist measures of synaesthesia. Absorption correlated moderately with tone synaesthesia ($r = .27$, $p < .05$) and with music synaesthesia ($r = .28$, $p < .05$), replicating Rader and Tellegen's (1987) results.

latter measure was designed to assess both richness (i.e., degree of detail in participants' visual imagery) and cohesion (i.e., coordination of visual imagery) of synaesthetic experience in response to music. Each participants' protocol was judged on a 5-point scale, with a score of 1 indicating low vividness and a score of 5 indicating high vividness of synaesthetic experience.[40] Three representative protocols are presented below; the first represents a vividness score of 1 the second represents a vividness score of 3, and the third represents a vividness score of 5:

Low Vividness Rating (Participant 29):

This music made me extremely sleepy. Maybe, it was because of the exercise before but whatever it was I felt like sleeping. The music sounds like something I have heard before, maybe something that would be played at a ballet. I did enjoy listening to this type of music, however.

Medium Vividness Rating (Participant 35):

Liked the pace of the music and the beginning and ending right hand melody very much. Felt somewhat disappointed with the variation in the middle of the piece, which somehow didn't follow the pattern I thought it should. Felt relaxed except for a couple of notes of discord. Imagined time standing still for a moment on a sunny afternoon, when all the world stopped to take a slow breath. Would have preferred to listen to the music outside as opposed to in here at a cold, hard table but could imagine myself out there anyway so the setting was of little consequence. Very steady pace to song, with controlled effort. Brought to mind a similar piece.

High Vividness Rating (Participant 13):

I could see soft rain falling on a lush green field. A white Victorian style country home with a huge porch. I could imagine myself sitting on the porch with a cup of tea watching the rain fall. Smelling the fresh, clean air and flowers around me on the porch. The music gives a feeling of tranquility, peacefulness, natural surroundings. It makes me think of a lazy day with nothing to do but relax and watch the rain fall.

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40. A judge, blind to both the hypotheses of the study and absorption group assignments, rated a randomly-drawn subset of 10 written protocols for number of distinct visual objects reported, number of feeling qualities, and vividness of synaesthetic experience. Correlations between the judge's ratings and the original scores indicated acceptable interrater reliability (r's = .99, .92 and .77 for the visual objects measure, feeling qualities measure, and the vividness measure, respectively).

Three one-way ANOVA's were performed on the visual object, feeling quality, and vividness measures of synaesthetic experience. These analyses indicated a marginal effect of absorption groups on the number of visual objects described in the protocols, $F(3, 64) = 2.23$, $p < .09$. There were no effects of participant groups on the number of feeling qualities described in the written accounts ($F(3, 64) = 1.08$, ns.), but there was a main effect of absorption groups on vividness of synaesthetic experience while listening to the music, $F(3, 64) = 3.05$, $p < .04$.

Table 6
Absorption and Protocol Measures of Synaesthetic Experience.

	Absorption Groups			
	Low	Medium	High	High-Arts
Visual Objects	1.55	3.76	4.08	5.27
Feelings	3.45	3.64	4.83	3.36
Vividness	2.15_a	3.16_b	3.08_b	3.18_b

Note. Means with different subscripts differ significantly at $p < .05$ by Neuman-Keuls pairwise comparisons.

As Table 6 shows, the number of distinct visual objects reported during experiences of the Satie piece increased progressively as a function of absorption groups, with high absorption participants with prior training and interest in the arts reporting the greatest number of imagined visual objects while hearing the music. The vividness of synaesthetic experience measure primarily differentiated low absorption participants from the other three groups, as their mean vividness score was reliably lower than the medium, high, and high absorption-culture absorbed groups ($p < .05$). Thus, it appears that the Satie piece was evocative of relatively vivid cross-modal, synaesthetic experiences but to a lesser degree for low absorption participants.

Summary: Data collected to assess synaesthetic ascription showed the effects of absorption groups on this general cognitive process. High absorption participants with prior artistic training were more reliable in making colour-sound meaning ascriptions. These participants also reported experiencing cross-modal visual imagery and colour in response to sounds and music to a greater degree than other participants.

3. Metaphoric Elaboration

Each participant completed the Similes test (Schaefer, 1971), at home, between sessions 1 and 2 of the experiment. This test consists of a set of 10 stimulus images (e.g., "The fish felt slippery, like _____). Participants were required to complete the simile stem with three endings; each was instructed "to make your endings as imaginative as you can. Try to think up fresh new endings that nobody has used before". These instructions were designed to induce participants to metaphorically elaborate each stimulus image by relating it to different entities.

Each completed stem was scored using norms developed by Schaefer (1971). Each stem was scored for originality on a 0--5 scale designed to tap both novelty and aptness of the participant's response. Scores of 0 were assigned to stems that were restatements of the stimulus image, or to stems that were inappropriate, offering no true comparison. Scores of 5 were assigned to stems of exceptional quality, offering a unique response that "has an arresting effect on the reader and results in a desire to savor" (Schaefer, 1971, p. 14). Intermediate scores of 2 or 3 were assigned to stem completions that were very common, trite expressions (score = 2) and completions that were common and of fair quality (score = 3).

As an example, the following score ranges were assigned to stems produced in response to the stimulus image "The house was as silent as _____":

- a house (participant 65, score = 0)
- Rusty's at Christmas (participant 24, score = 1)
- a mouse (participant 28, score = 2)
- a radio with no batteries (participant 35, score = 3)
- a lone man on the moon (participant 47, score = 4)
- a tear that takes a minute to roll down a withered cheek (participant 64, score = 5)

Three of the 68 participants did not return the Similes test for session 2 of the study, leaving 65 in the final sample. Participants who did not complete a simile stem were assigned a score of 0 for that item. Because of potential confusion regarding the number of stem completions to be generated, two scores were calculated for each participant. First, a total originality score was calculated by summing the ratings for each of 3 stem completion across the 10 stimulus images. Participants who did not complete a simile stem were assigned a score of 0 for that item. As well, originality scores for the first stem completion were summed separately for the 10 stimulus images. Table 7 presents the means for each of these measures.

Table 7
Simile Originality Scores for Absorption Groups

	Absorption Groups			
	Low	Medium	High	High-Arts
Total Originality	113.0	120.5	97.7	92.0
First Stem Originality	27.5	31.9	25.5	27.7

One-way ANOVAs for each originality score did not indicate main effects of absorption groups for either the total originality score ($F(3, 61) = .9583$, ns.) or the first-stem originality score ($F(3, 61) = 1.56$, ns.). The group means indicated that medium absorption participants exhibited greater originality in their simile completion stems, compared to the other groups. Recall that about half of the medium absorption participants in this study reported reading a large number of books, poems, and novels over the past year, the greatest for all participants in the sample. Perhaps these participants' reading habits prepared them for generating original stem completions to a greater extent than other participants.

Summary: There were no reliable differences among the 4 absorption groups with respect to metaphoric elaboration, as assessed by Schaefer's (1971) Similes test. In fact, the pattern of means was opposite to that predicted, i.e., low and medium absorption participants were judged to be more original in their stem completions than high absorption or high absorption-culture absorbed participants.

C. Hypothesis 2: Cross-Modal Effects of Music on Experience of Klee's Composition.

1. Preliminary Data Reduction and Manipulation Check

Factor Analyses: Recall that identical sets of 14 bipolar scales were used to evaluate the music and the test painting. These 14 scales were factor analyzed separately for the music (n = 45) and painting (N = 68) questionnaires, in order to simplify the patterns of meanings attributed to the aesthetic media and to allow for comparisons across the music and painting ratings.

Principal-components analysis with varimax rotation was performed on the 14 music rating scales. A scree test indicated that 2 factors, accounting for 66 % of the common variance in the 14 rating scales, best described the pattern of connotative meanings attributed to the music by the participants. Results of this factor analysis are presented in Table 8.

Table 8
Varimax-Rotated Factor Analysis of Music Rating Scales.

Scale	Factor I	Factor II
Beautiful-ugly	-.94	
Awful-nice	.92	
Unpleasant-pleasant	.92	
Worthless-valuable	.91	
Boring-interesting	.72	
Quiet-noisy	-.67	.53
Dead-alive	.62	.33
Tranquil-tense	-.61	.55
Mild-intense		.81
Passive-active		.71
Weak-powerful	.49	.69
Static-dynamic	.38	.64
Subtle-bold		.63
Repetitive-random	-.39	.53
Eigenvalue	5.8	3.4
Percent of Variance	41.5	24.5

Note. Positive loadings indicate endorsement of the uncapitalized scale pole.

As Table 8 indicates, Factor I (accounting for 41.5 % of the variance) was associated with ratings of the music as beautiful, nice, pleasant, valuable, quiet, interesting,

alive, and tranquil. These loadings were interpreted as a "Pleasingness" factor. The 8 scales exhibiting high loadings (> .60) on this factor were summed to yield an overall pleasingness score for each participant, which exhibited high internal consistency (Cronbach's alpha = .93). Factor II (accounting for 24.5 % of the variance) was associated with ratings of the music as intense, active, powerful, dynamic, and bold. These loadings were interpreted as an "Activity" factor. These 5 scales were summed to yield an overall activity score for each participant, which also exhibited acceptable internal consistency (Cronbach's alpha = .76).

Next, principal-components analysis with varimax rotation was performed on the 14 painting rating scales. A scree test indicated that 3 factors, accounting for 72 % of the common variance in the 14 rating scales, best described the pattern of connotative meanings attributed to the painting. Results of this factor analysis are presented in Table 9.

Table 9
Varimax-Rotated Factor Analysis of Painting Rating Scales.

Scale	Factor I	Factor II	Factor III
Beautiful-ugly	-.83		
Awful-nice	.83		-.33
Unpleasant-pleasant	.81		-.30
Worthless-valuable	.85		
Boring-interesting	.88		
Quiet-noisy	-.39	.74	
Dead-alive	.81	.33	
Tranquil-tense		.79	
Mild-intense		.56	.69
Passive-active		.78	
Weak-powerful	.56	.40	.51
Static-dynamic		.74	
Subtle-bold		.50	.57
Repetitive-random			.70
Eigenvalue	5.3	3.6	1.2
Percent of Variance	38.1	25.5	8.3

Note. Positive loadings indicate endorsement of the uncapitalized scale pole.

As Table 9 shows, Factor I (accounting for 38.1 % of the variance) was associated with ratings of the painting as beautiful, nice, pleasant, valuable, interesting, and alive. These loadings were interpreted as a "Pleasingness" factor.

The 6 scales exhibiting loadings of .60 or greater were summed to yield a composite pleasingness score, which exhibited high internal consistency (Cronbach's alpha = .92). Factor II (accounting for 25.5 % of the variance) was associated with ratings of the painting as tense, active, dynamic, and noisy. These loadings were interpreted as an "Activity" factor. The 4 scales were summed to yield a composite activity score (Cronbach's alpha = .80). Finally, Factor III (accounting for 8.3 % of the variance) was associated with ratings of the painting as random and intense. These loadings were interpreted as a "Randomness" factor, and the 2 scales were summed to yield a composite randomness score (Cronbach's alpha = .67).

Manipulation Check: Initial analyses of the music rating scales sought to determine the relative impact of different types of music (i.e., Cage vs. Debussy) on participants' reactions. 4 X 2 ANOVAs (low, medium, high and high-culture absorbed groups X Cage, Debussy music) were performed on the pleasingness and activity composite measures. Analyses revealed a reliable main effect of music type on the pleasingness composite scale, $F(1, 37) = 39.2$, $p < .0001$. Inspection of the means showed that participants who heard the Debussy piece rated it as more pleasing ($M = 56.0$) than participants who listened to the Cage piece ($M = 28.5$). The manipulation of tonality and degree of randomness was successful in influencing rated pleasingness of the music.

2. Analyses of Reactions to Klee's Composition

Given the effectiveness of the tonal/repetitive and atonal/random music manipulation, the next issue to be addressed was to determine any cross-modal effects of music and/or absorption groups on reactions to the Klee test painting.

Ratings of the Test Painting: A series of 4 X 3 ANOVAs (low, medium, high absorption and high absorption-culture absorbed groups X Cage, Debussy, no music controls) were performed on the pleasingness, activity, and randomness composite scores. These analyses revealed main effects for both absorption groups and music condition on each of the 3 composite scores. There were no absorption group X music type interactions for these measures.

Considering the music factor first, there were reliable effects of music type on perceptions of the Klee's pleasingness ($F(2, 56) = 3.05$, $p < .06$), activity ($F(2, 56) = 3.14$, $p < .05$), and randomness ($F(2, 56) = 3.09$, $p < .05$).[41]

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41. There were main effects of absorption groups on perceptions of the Klee's pleasingness ($F(3, 56) = 3.14$, $p < .03$), and marginal effects on perceived activity ($F(3, 56) = 2.60$, $p < .06$), and randomness ($F(3, 56) = 2.29$, $p < .09$). Low absorption participants generally perceived the Klee as less pleasing ($M = 28.3$) than both medium absorption participants ($M = 34.4$) and high absorption participants who had previous training and interests in the arts ($M = 38.3$, $p < .05$). High absorption participants perceived the painting as less active ($M = 12.58$) than both medium

Table 10 presents the means for the music main effect.

Table 10
Main Effect of Music Type on Ratings of Klee's Composition.

	Music Effect		
	Cage	Debussy	Control
Composite Scale			
Pleasingness	29.1_a	32.7	35.9_b
Activity	18.9_a	18.6_a	14.1_b
Randomness	12.2_a	10.9	9.7_b

Note. Means with different subscripts are significantly different at $p < .05$ by Fisher's protected t-test.

Across the 4 absorption groups, participants who heard Cage while viewing the painting rated it as less pleasing ($M = 29.1$) and more random ($M = 12.2$) than no music controls (M's = 35.9 and 9.7 for pleasingness and randomness, $p < .05$). Also, participants who heard either Cage or Debussy pieces while viewing the painting rated it as possessing more activity, (M's = 18.9 and 18.6 respectively) than no-music controls ($M = 14.1$, $p < .05$). It appears that exposure to the atonal, random structure of the Cage piece decreased perceived pleasingness and increased perceived randomness of the Klee painting, relative to a no-music control group. However, exposure to either type of music appears to have increased perceived activity in the Klee painting.

Correlational Analyses: In order to more specifically address the question of relations between musical structure and meanings ascribed to the test painting, correlations were computed between four variables within the Cage and Debussy conditions: music pleasingness, music activity, painting pleasingness, and painting activity. Significant within-condition correlations between the music and painting measures would suggest convergence between reactions to the music and reactions to the painting. These correlations are presented in Table 11.

absorption participants ($M = 18.04$) and high absorption participants with prior artistic training ($M = 20.55$, $p < .05$).

Table 11
Within-Condition Correlations Between Music and Painting Scales.

	M-Pleas.	M-Act.	P-Pleas.	P-Act.
M-Pleasingness	---	-.20	-.07	.03
M-Activity	.49**	---	.03	-.04
P-Pleasingness	.46**	.37*	---	-.20
P-Activity	.05	.18	.17	---

Notes. ** = $p < .05$ * = $p < .10$. Debussy correlations presented in lower diagonal ($n = 22$). Cage correlations presented in upper diagonal ($n = 23$). M refers to music ratings, P refers to painting ratings.

Table 11 shows that participants who heard the Debussy music while viewing the painting exhibited moderate positive correlations between the music ratings and the paintings ratings, indicating convergence of reactions across aesthetic media. For example rated pleasingness of the music correlated positively ($r = .46$, $p < .05$) with rated pleasingness of the painting. Rated activity of the music also correlated positively ($r = .37$, $p < .05$) with rated pleasingness of the painting. The tonal, structured character of the Debussy piece appears to have integrated participants' reactions to the music and to the painting.

Participants who heard the Cage music, however, exhibited no convergence between their ratings of the music and their ratings of the painting; painting pleasingness was uncorrelated with both rated music pleasingness and rated music activity. The atonal, random character of the Cage piece fostered pleasingness ratings of the music that were independent from pleasingness ratings of the painting. In the Cage condition, then, there appears to be no integration of music and painting reactions.

Additional Reactions to the Klee Painting: Three questions on the painting questionnaire assessed (1) how distracted participants were while viewing the painting, (2) awareness of feelings during the viewing, and (3) desire to view the painting further. A series of 4 X 3 ANOVAs (low, medium, high absorption, and high absorption-culture absorbed groups X Cage, Debussy, and no music conditions) were performed on these measures.

Analyses revealed main effects of music type on rated distraction during the viewing ($F(2, 56) = 6.06$, $p < .004$), awareness of feelings during the viewing ($F(2, 56) = 3.05$, $p < .06$, and for rated desire to view the painting further ($F(2, 32) = 5.69$, $p < .008$). Table 12 presents the condition means for these measures.

Table 12
Main Effects of Music Type on Additional Reactions to the Painting.

	Condition		
	Cage	Debussy	Control
Distraction	4.87_a	3.41_b	2.87_b
Awareness of Feelings	4.74_a	6.55_b	5.04_a
Further viewing	4.31_a	6.29_b	5.71_b

Note. Means with different subscripts are significantly different at $p < .05$ by Fisher's protected t-test.

Table 12 shows that participants who listened to Cage were more distracted while viewing the painting ($M = 4.87$) than participants who either heard the Debussy music or those who heard no music (M's = 3.41 and 2.87, respectively, $p < .05$). Also, people hearing the Cage music reported less interest in further viewing the painting ($M = 4.31$) compared with people hearing the Debussy piece or no-music controls (M's = 6.29 and 5.71, respectively, $p < .05$). Finally, people who heard Debussy while viewing the painting reported more awareness of feelings ($M = 6.55$) than participants who heard Cage ($M = 4.74$) and no-music controls ($M = 5.04$, $p < .05$).

3. Protocol Examples

The following examples are designed to illustrate to the reader the cross-modal effects of music on two participants' experiences of Klee's Composition. Each participant's verbal account of reactions to the test painting was transcribed verbatim from the tape recorded excerpts, coding for pauses, hesitations, and vocal emphasis. Then, each participant's transcript was decomposed into meaning units, i.e., statements expressing single aspects of conscious experience (cf. Kuiken, Schopflocher, & Wild, 1989).

The group data presented above supported the notion that the Debussy piece functioned to integrate painting and music reactions whereas the Cage piece in effect dissociated reactions across the two aesthetic media. How were these processes manifested in participants' conscious awareness? While a complete analysis of the entire set of 68 protocols was beyond the scope of the present study, the following two protocols illustrate how two particular participants experienced the music/painting pairings. They were provided by two high absorption participants with significant prior

training and experience in the arts. The first protocol was provided by a participant who heard Cage's Music of Changes while viewing the painting (participant 19) and the second example protocol was provided by a participant who heard Debussy's L'Ile Joyeuse while viewing the painting (participant 62):

Cage:

1. To start off with, looking at the painting,/
2. um (..) in this room I feel really uncomfortable doing this (..)/
3. but, um (..) the painting itself made me feel (2) kind of (..) apart from it (..)/
4. it--its very cool colours (..)/
5. there's nothing very warm about it (..)/
6. and the music that I was listening to while I was looking at it (..)/
7. was very (..) tense an--and fast, and upbeat (...)/
8. um (..) the picture (.) I saw several things in it (..)/
9. because it's so abstract (...)/
10. nothing that would make a lot of sense, um (..)/
11. but overall, I had a feeling of, um (coughs)/
12. just a really strange feeling/ END

This participant did not attribute a coherent meaning to the Klee, but commented that many interpretations were possible (unit 8). A 'strange' feeling was reported by the participant (unit 12), and the music was mentioned, but was not integrated with the interpretation of the painting (units 6-7). This participant also remarked that the painting created an alienating feeling (unit 3), and that it was 'cool' in emotional tone (units 4-5).

Compare these reactions to those provided by a high absorption-culture absorbed person who listened to Debussy while viewing the Klee test painting:

Debussy:

1. Um (..) I liked looking at the painting very much,/
2. I found it, um (..) very striking to look at it right away, um/
3. the music (..) I found was uh (..) it was quite intense and very building,

and the um (...)/
4. the starkness of the dark blue (..)
really um (..) shocked me,/
5. and um (..) somewhat frightened me,/
6. especially with (.) the--the white lines
(..) um, or the white colour on top of
the dark blue, and the light blue (..)/
7. to the left and right, the sort of arms
or wings of the (..) of the piece (..)/
8. um (1) I found there was ahm (.)
a lot of um (..) tension (...) in the
painting that disturbed me,/
9. and sadness as well, and um (1) and some
anger, that um um (1) really kept me
very riveted (.) looking at it,/
10. and I found (..) that the dark blue
and the white, very stimulating
(..) a very sharp contrast, and um (...)/
11. very riveting, I--I was mesmerized
by it (..)/
12. and as the music was swirling around,
this (.) so-sort of very solid (.)
dark blue and the-the-white circles
would go round and round that um (..)/
13. I found that very , um (...) captivating,
um (1)/
14. it--it's not a piece that I uh (laughs)
(..) would like to see (..) um (..)
in my own home,/
15. because I found it (1) not very um not
very (.) gentle, but, um (..)/
16. I--I liked it, I think, yeah,/
17. I liked it very much (..) um (3)/
18. I--I think, yeah/ END

Several aspects of this protocol are notable, and provide potential lines of inquiry for future study. This participant experienced a convergence between reactions to the music and reactions to the painting (unit 12). Specifically, the 'swirling' quality of the music was integrated with the circular light areas at the top of the painting. Second, the painting evoked rather strong affective reactions, which were described as being 'mesmerized', 'captivated', and 'riveted' to colour contrasts presented in the painting (units 9, 11, 13). These excerpts suggest that the structured, tonal musical context provided by the Debussy piece encouraged cross-modal integrative processes for this participant during cognition of the work, which in turn enhanced visual perceptions of colour contrasts, and deepened affective involvement with the painting, expressed by terms such as being 'riveted' and 'captivated'.

Although these protocol examples only provide accounts of two individual viewing experiences, both highlight some of the central themes of the cross-modality portion of this study. At least for these two participants, when cross-modal manipulations of musical context were attempted, an atonal, random musical context distracted the viewer of a painting and encouraged confusion and aversive reactions. A tonal, structured musical context provided for a different individual was associated more positive reactions, increased awareness of feelings and the integration of meaning across visual and auditory aesthetic media.

V. Summary and Discussion

A. Absorption and Artistic Pursuits

An important finding of the research was that absorption (imaginative involvement; Tellegen & Atkinson, 1974) and artistic pursuits are systematically related. Specifically, high levels of art education, art training and art appreciation were found almost exclusively in a subset of participants reporting high absorption scale scores. This pattern of artistic and aesthetic interests was not associated with medium and low absorption participants, who tended to be uninvolved in aesthetic activities or reported using aesthetic pursuits as forms of entertainment and diversion.

This finding highlights an important issue for future research, specifically, to determine whether high absorbers are more motivated to participate in creative and art-appreciative activities or whether involvement in aesthetic activities increases imaginative involvement. Longitudinal studies of absorption and artistic training may help to resolve the issue; high levels of absorption may only be reported subsequent to artistic and art-appreciative training. Alternatively, absorption scores may remain stable over time and be relatively unaffected by artistic training.

Another issue raised by the results concerns the nature of people classified in the 'entertainment culture' group. The present study did not ask these participants to specify the kinds of music and literature occupying so much of their time. Perhaps these people spend their days with a radio on, or their nights reading popularized, 'romantic' fiction. Or perhaps these participants spend a great deal of time contemplating 'serious' art. This information may be important in determining transitions from art as a form of entertainment or diversion to the acquisition of serious aesthetic pursuits. A person who reads 40 'romantic' novels a year, for example, might become bored over time and start to read classical literature. In turn, this may facilitate pronounced involvement in aesthetic pursuits, perhaps by writing a journal or attending writers' workshops. A person who uses music habitually for purposes of mood regulation may be particularly affected by one piece, which may serve as a basis for more serious investigation of the composer's work.[42] These hypothetical events point to the need for assessing 'everyday' aesthetic activities and the functions they serve for people (Konecni, 1982).

B. Evaluation of the Hypotheses

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42. The present data suggest that pairing Debussy with Klee functioned integratively to deepen aesthetic experience. Perhaps an impactful cross-modal aesthetic experience of this sort can serve as a motivator for further exploration of integrative possibilities during cognition, perhaps by becoming more involved with aesthetic pursuits.

The hypotheses underlying the present research were that (1) absorption and artistic background would predict reliable individual differences in general meaning ascription processes (figure-ground differentiation, synaesthetic ascription, metaphoric elaboration), and that (2) musical tonality and structure would affect cross-modal meaning ascription processes during a viewing of an abstract painting. Where do we now stand with respect to these hypotheses?

Hypothesis 1: Figure-ground differentiation refers to the ability to individuate an [OBJECT] in conscious awareness on the basis of incomplete or ambiguous information. This component of the meaning ascription process was significantly affected by absorption such that high-absorption participants more quickly individuated [OBJECTS] when presented with incomplete figures. Perhaps the rapidity of figure-ground differentiation reflects experienced immediacy in the meaning ascription process. Artistic training and interests provided no additional benefit in immediacy of figure-ground differentiation over that provided by high levels of absorption. In a painting perception task, high absorption participants with prior artistic training exhibited greater productivity in figure-ground differentiation: they individuated a greater number of objects, things, and events when presented with abstract expressionist painting than medium and low absorption participants. Taken together, these data confirm that absorption and artistic training affect one important component aspect of the meaning ascription process: the ability to individuate [OBJECTS] in awareness within a single sensory modality. Absorption per se facilitates speed of meaning ascription, perhaps indicating that high-absorption participants are more prone to be immediately 'captivated' by sights and sounds than low absorption participants. Absorption in conjunction with artistic training facilitates multiple reference in object individuation, indicating that knowledge and training in the arts enhances the ability to conceive and reconceive presented objects.

Synaesthetic ascription refers to the ability to integrate meanings across sensory modalities and domains. This component of the meaning ascription process was also affected by absorption and artistic background. High-absorption participants with prior training and interest in the arts proved to be most reliable in synaesthetic translation during a colour-sound meaning ascription task. These participants deviated less from group norms for translation than low absorption participants, who were more arbitrary and idiosyncratic in their colour-sound meaning ascriptions. These data suggest that artistic training and interests in a variety of aesthetic media enhance high absorbers' knowledge of the way sound and colour are related.

Checklist measures of synaesthetic experience similarly showed that high-absorption participants having artistic training experienced colours with greater frequency when presented with tones and music. Protocol measures of synaesthetic experience showed a marginal linear trend such that the number of visual objects in response to a musical composition increased progressively as a function of absorption, culminating in high-absorption/culture absorbed participants experiencing the greatest number of visual objects. High absorption participants with artistic training reported significantly more vivid and coherent visual imagery in response to music, compared with low absorption participants.

Taken together, these data confirm that absorption and art background mediate another important component of the meaning ascription process: the ability to individuate [OBJECTS] across sensory modalities. Reliability of synaesthetic translation and the frequency and vividness of synaesthetic experience were both especially pronounced for high absorption participants with prior training and interest in the arts.

Metaphoric elaboration refers to the ability to individuate meanings of a contextualized [OBJECT] by generating additional properties of the object and by relating the object to other entities and domains. This component of the meaning ascription process was unrelated to groups defined by absorption and art background. Reasons for this null effect are unclear. First, the ability to generate novel and apt similies and metaphors are most likely related to verbal abilities (e.g., verbal fluency). Prior research has not investigated absorption and verbal abilities, and these null findings perhaps indicate that absorption and artistic training affect meaning ascription in visual and auditory domains to a greater degree than in the domain of language. Second, Schaefer's (1971) norms for scoring the similies pose interpretive problems by confounding novelty and aptness of participants' responses. For example the scoring system assigns low scores for cliches, i.e., extremely common responses to presented stimuli. It is possible that cliches are in fact apt, if not novel, elaborations of presented meanings. Finally, the pattern of mean originality scores on the similies task indicated a nonsignificant trend for medium and low absorption participants to be more original in generating similie stems. Recall that these levels of absorption were associated with the entertainment culture group, which reported reading a large number of books, poems, and novels over the past year, the greatest for all participants in the sample. Perhaps the reading habits of low and medium absorption participants facilitated the generation of original stem completions to a greater extent than other participants, who tended not to read as much literature. This interpretation is speculation,

however, owing to the lack of information regarding the kinds of books participants in this group read, as previously noted.

Taken as a whole, however, the research provides considerable support for hypothesis 1. Absorption and artistic background do predict reliable individual differences in meaning ascription processes. All participants were able to engage in figure-ground differentiation and synaesthetic ascription. But there were consistent differences between participants in the ways that meaning is ascribed in conscious awareness, i.e., in ways that general cognitive processes utilize conceptual structure during meaning ascription. People differ in speed and productivity of [OBJECT] individuation, the degree to which reliable cross-modal meanings are ascribed, and the extent to which vivid cross-modal experience occurs. This research revealed an array of individual differences, organized by absorption and artistic training, that directly affect the ability to create and integrate meanings in conscious awareness. These data support the notion that certain people are more prone than others to experience enriched and deepened meanings during cognition of mundane visual and auditory stimuli.

Hypothesis 2: A manipulation of musical context during the viewing of an ambiguous painting affected participants' interpretations and reactions to the visual artwork in systematic ways. People who heard atonal, random music while viewing Klee's Composition rated it as less pleasing and more random than no-music controls. This musical context also functioned to increase distraction during the viewing and decreased interest in further viewing, compared to a tonal/repetitive musical context and no-music controls. In contrast, people exposed to the tonal/repetitive musical context reported more favorable reactions to the painting and reported more awareness of feelings during the viewing, compared with participants who were exposed to atonal/random music and controls. Interestingly, participants who heard either type of music while viewing the painting rated it as possessing more activity. This raises the possibility that any auditory input at the time of viewing enhances experienced dynamism of a static visual display.

Correlational results within conditions showed that the tonal/repetitive musical context functioned to integrate reactions across musical and visual aesthetic media. People hearing this kind of music exhibited convergences between painting and music ratings. The atonal/random musical context did not function integratively; people who heard this kind of music did not exhibit correspondences between painting and music ratings. Indeed, there appeared to be a dissociation of music and painting reactions in the atonal/random musical context. One interpretation of these results is that the unfamiliar and distracting nature of the

Cage piece drew attention away from the test painting, which was stereotypically characterized as 'one of those ugly abstract paintings you occasionally have the displeasure of seeing'.

Cross-modal effects of music on meaning attribution did not interact with absorption. It is likely that the predicted interaction between absorption and music conditions failed to occur because of low sample sizes for each cell in the complete design, which provided only a weak test of the interaction hypothesis. Nevertheless, across the music conditions, low absorption participants perceived the test painting as less pleasing than other participants in the sample. Perhaps their lack of involvement in aesthetic pursuits influenced their relatively negative reactions. Also, medium absorption participants and high absorption participants with prior artistic training perceived the Klee as more active (e.g., dynamic, tense) compared to other participants.

Taken as a whole, the present data provide considerable support for hypothesis 2. Musical context does affect meaning ascription during contemplation of a painting. Tonal, repetitive music facilitated interpretations of a painting as pleasing and beautiful, increased awareness of feelings during the viewing, and fostered a desire to experience the artwork again. Atonal, random music facilitated interpretations of the same painting as displeasing and ugly, increased distraction during the viewing, and fostered a low desire to experience the artwork again. These data support the notion that the same visual artwork will be interpreted differently as a function of different musical contexts and are consistent with the integrative postulate of cognition outlined earlier. Cognition does function to integrate information across sensory modalities such that contextualized meanings are presented to conscious awareness.

C. Implications for a Theory of Cognition

Many accounts of cognition are predicated on the idea that there is an innate "language of thought" (Fodor, 1975) consisting of symbols, rules for their combination, and algorithms which govern symbol manipulation. Meaning, on this view, is a byproduct of symbol manipulation such that semantic relations in a given domain are preserved. I argued earlier that such theorizing gives priority to the symbol level of analysis and bypasses important issues regarding explication of (1) the referents of the symbol system, i.e., meanings instantiated by input-output regularities, and (2) the relationship between cognitive processes and contents of conscious awareness.

The present research confirms the utility of a research strategy designed to describe regularities at the semantic

level of analysis per se (cf. Pylyshyn, 1984). Instead of positing meanings instantiated by symbol manipulation and explicating algorithms to simulate or reproduce semantic regularities, the present research shows how individual differences affect the creation and integration of meaning itself, with direct consequences for conscious awareness. On the current theory, we are endowed with a limited set of representational primitives in conceptual structure and a set of cognitive processes designed to present meanings to awareness. To be sure, representational primitives and cognitive processes are part of our organismic capacity for meaning-making, but they do not predetermine the results of meaning ascription, as would be expected from theories preoccupied with the task of simulating semantic relations via algorithmic symbol manipulation. Rather, meaning ascription processes are responsive to (1) individual differences in general resources, knowledge, and skills underlying cognition (in the present case, resources such as absorption and artistic training), and (2) the environmental context the cognizer finds him/herself in (in the present case, a context provided by music during contemplation of visual art).

Functional Decomposition: Figure-ground differentiation, synaesthetic ascription, and metaphoric elaboration are descriptive terms designed to cover broad aspects of meaning ascription. As such, they form a heuristic conception of general cognitive processes that reflect an interest in issues situated at the semantic level of analysis (i.e., relations between conscious awareness and the generation of meaning). Because this is a heuristic conception, one direction for future research might be to decompose each process into subcomponents (Cummins, 1983). For example, figure-ground differentiation may be conceived as a set of three subprocesses: sensory transduction, within-modality feature integration, and a process matching integrated features to memory (Pinker, 1985). Synaesthetic ascription may similarly be decomposed into sensory transduction, cross-modality feature integration, and an operation to scale properties across modalities and domains.

Efforts to decompose general cognitive processes into components can serve a useful function, but only if such efforts attend to conceptual issues at the semantic level of analysis. First, a useful distinction can be made between subprocesses having direct consequences for conscious awareness (e.g., in the initiation of processes and/or the reception of outputs in awareness) and subprocesses that are automatic and algorithmic in nature, operating outside of awareness. Second, functional decomposition should proceed in a manner that differentiates subprocesses influenced by knowledge and prior experience from subprocesses that are insensitive to such influences (see Pylyshyn's (1984) discussion of 'cognitive penetrability'). Sensory

transduction, for instance, occurs outside conscious awareness and is insensitive to effects of prior knowledge and cognitive skills. Subprocesses such as these function to constrain meaning ascription as they provide upper and/or lower bounds on information that the organisim can acquire from the external (exteroception) or internal (interoception) environment.[43]

Because of the algorithmic nature of such processes functioning outside of awareness, they cannot be expected to offer much in the way of explicating variations among people in the creation and integration of meaning. This is precisely because they are rule-governed procedures that generate consistent and perhaps invariant outputs, given appropriate input conditions. When the semantic level of analysis is emphasized in cognitive studies, we become interested in outputs of such cognitively impenetrable processes insofar as they account for similarities in meaning ascription across people. Because of demonstrated variability in meaning ascription beyond the level of sensory transduction, further work is needed to describe subsequent cognitive processes that (1) are sensitive to individual differences in general cognitive resources, and (2) have direct consequences for conscious awareness.[44] The value of the current theory is that it provides a conceptual framework for functional decomposition that may aid in drawing distinctions between automatic cognitive processes functioning outside of awareness and processes that reflect individual variations in the meaning ascription process.

A mechanism for integration?: Data from the study indicate that conceptual structure is used dynamically in the meaning ascription process. Consider an example protocol presented in the previous chapter. How are we to account for the high absorber with prior artistic training reporting the "swirling" quality heard in the tonal music and simultaneously seen in the test painting? Beyond confirming the integrative postulate in the current theory of cognition, this example suggests possibilities for developing an account of how meaning is integrated across sensory modalities and domains.

One possibility is that meanings created and integrated across modalities result from a mechanism that functions as a redescription device (cf. Mandler, 1992). Perhaps outputs of low-level visual, auditory, and kinaesthetic transduction processes are taken as inputs by such a device and are

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43. For example, the retina cannot detect ultraviolet light, therefore painters cannot paint this part of the spectrum and viewers could not transduce such information. Similarly, the basilar membrane cannot transduce sound described as 40,000 hz, therefore composers avoid such frequencies in composition because such sounds will have no effect on the listener.

44. I do not wish to preclude the possibility that low-level sensory transduction could itself exhibit individual variations in meaning ascription. For example, a person whose retina is damaged could be expected to ascribe meanings in ways that are systematically different from a person with intact visual physiology.

'reformatted' in conceptual structure. Reformatting may involve a scaling operation wherein spatial, temporal, and expressive properties are fused, resulting in a multimodal, dynamic redescription of inputs. Knowledge and attention then serve to contextualize this dynamic representation in conceptual structure and to individuate fused spatial, temporal, and expressive properties in awareness. In the present example, outputs of auditory and visual sensory transduction were redescribed and rescaled in conceptual structure, resulting in a dynamic representation in conceptual structure: [SWIRLING OBJECT].[45] Following perceptual redescription, attention was drawn to these characteristics of sight and sound such that the person was 'riveted' and 'captivated' by the cross-modal correspondence between music and the painting. In contrast, low absorption participants, who typically exhibit negligible artistic interest and training have perhaps not had sufficient cross-modality and cross-domain experience to facilitate redescription in conceptual structure. This in turn raises another issue for further research, i.e., whether such an integrative mechanism develops as a function of repeated cross-domain and cross-modal experiences, or whether it is cognitively impenetrable, i.e., uninfluenced by development and knowledge.

This account is admittedly speculative and is offered only as a tentative step toward understanding how information integration in conceptual structure occurs. But the virtue of analysis at the semantic level is that it provides explication of the phenomena-in-conscious-awareness to be accounted for by any such mechanistic procedure. If we had not had the example protocol to reflect on, i.e., if we had not considered the nature of cross-modal correspondence by explicating the semantic regularities in the first place, speculation about mechanisms of cross-modal and cross-domain integration would seem premature and strained.

D. Implications for Experimental Aesthetics

Many theories in experimental aesthetics are predicated on the idea that there is an objective, transcendental description of beauty that can be codified in an abstract notation system. Aesthetic response, on this view, consists of pleasurable reactions and preferences for stimulus configurations instantiating the codified vocabulary for beauty. I argued earlier that such theorizing limits our understanding of aesthetic experience because it cannot accommodate historically situated stylistic practices and

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45. In the present example, perhaps a particular pitch pattern (e.g., a glissando in the piano composition) was identified at the same time that the visual system identified a figural property (e.g., a sequence of curves). The redescription device perhaps fused and rescaled the properties in conceptual structure, resulting in cross-modal correspondence of features and the formation of the contextualized representational primitive.

because it promotes a unidimensional conception of aesthetic experience in terms of pleasure.

The present research confirms the utility of a research strategy that makes relatively few presuppositions about 'fundamental' stimulus parameters governing aesthetic response and seeks to explicate aesthetic experience in its multidimensional complexity.

Stimulus Codification Revisited: This research showed how a single visual artwork can be endowed with different meanings in different contexts. First, meanings ascribed to the Klee painting differed as a function of organismic context, i.e., cognitive processes, knowledge, and training art appreciators bring to aesthetic contemplation. The protocol examples provided earlier showed how people differing in figure-ground differentiation and synaesthetic ascription abilities ascribed different meanings to the artwork. A person who could not quickly flexibly individuate [OBJECTS] from conceptual structure and who made arbitrary sound-colour associations individuated the painting as meaningless and rejected it as possessing little value. In contrast, a person who exhibited immediacy and repleteness in figure-ground differentiation and reliability and vividness in synaesthetic ascription individuated the artwork in multiple ways and spontaneously associated visual qualities and feeling. The same stimulus properties were visually presented to both participants and yet organismic context deepened and enriched experience of the painting in one case and not the other. These results do not bode well for stimulus-governed theories of aesthetic response, which hold that common and perhaps invariant reactions should occur, given the invariant nature of the visual stimulus. After all, the painting presented the same set of codified stimulus properties to all participants; these codified properties occupy static values in a quantitative notation scheme describing the painting's beauty.

Second, meanings ascribed to the painting differed as a function of musical context provided for aesthetic contemplation. Tonal, repetitive music functioned to integrate reactions across aesthetic media, whereas atonal, random music dissociated reactions across aesthetic media. These results show the impact of environmental context on art contemplation and indicate yet another source of variability in the ascription of meaning to visual art. Again, this would not be predicted by stimulus-based accounts of aesthetic response because the 'same' codified visual stimulus properties were presented to all participants across music conditions.

The present data thus seem to provide a strong case against the role of codified stimulus properties in the determination of aesthetic response. Specifically, a painting is not invariant or neutral with respect to organismic and environmental sources of context for the

apprehension of such properties. Taken to an extreme, we might argue that organismic and environmental factors are so influential in the formation of responses to art that it is meaningless to speak of the 'same' codified stimulus properties being presented to all art appreciators.[46]

However, an argument that may be raised at this point concerns the notion of stylistic codification, especially in consideration of the tonal/repetitive vs. atonal/random music manipulation. Is it not the case that I have proposed codified stylistic parameters that people are innately structured to respond to? This argument incorrectly reflects the intention underlying the selection of musical stimuli. In particular, the music manipulation was designed to reflect historically and culturally situated variations in musical style. That is, I chose musical excerpts that reflect contingent stylistic practices (those of Cage and Debussy) in order to understand how these culturally-situated variations in style impact on meaning ascription processes. The excerpts were not selected to reflect values in a transcendental notation scheme wherein all sound varies on the dimensions of tonality and repetitiveness. This reflects my conviction that we need to understand the interplay between contingent stylistic practices and appreciators' reactions to those conventions.

The Complexity of Aesthetic Experience: Extant theories in experimental aesthetics would have us believe that responses to art are best conceived on a single dimension: pleasure. We prefer certain stimulus configurations over others because 'beautiful' objects create pleasure within us. Accordingly, in order to assess aesthetic response, we should empirically determine pleasure and preference in response to various configurations of stimulus properties. The present research indicates that pleasure is but one aspect of meaning ascribed during contemplation of art, and that we should perhaps abandon a unidimensional, hedonistic conception of aesthetic response in favour of measurement operations allowing for a more differentiated and complex conception of meanings ascribed to art.

Consider again a portion of the example protocol presented in the previous chapter:

1. Um (..) I liked looking at the painting very much,/
2. I found it, um (..) very striking to look at it right away, um/
3. the music (..) I found was uh (..) it was quite intense and very building, and the um (...)/

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46. This is not to adopt a solipsistic position on the nature of art. Rather, as the research shows, individual differences in organismic context and environmental context facilitate meaning ascription during aesthetic contemplation in regular, if not lawful, ways.

4. the starkness of the dark blue (..)
really um (..) shocked me,/
5. and um (..) somewhat frightened me,/
6. especially with (.) the--the white lines
(..) um, or the white colour on top of
the dark blue, and the light blue (..)/
7. to the left and right, the sort of arms
or wings of the (..) of the piece (..)/
8. um (1) I found there was ahm (.)
a lot of um (..) tension (...) in the
painting that disturbed me,/
9. and sadness as well, and um (1) and some
anger, that um um (1) really kept me
very riveted (.) looking at it,/
10. and I found (..) that the dark blue
and the white, very stimulating
(..) a very sharp contrast, and um (...)/
11. very riveting, I--I was mesmerized
by it (..)/
12. and as the music was swirling around,
this (.) so-sort of very solid (.)
dark blue and the-the-white circles
would go round and round that um (..)/
13. I found that very , um (...) captivating,
um (1)/

An examination of the utterances contained in this protocol confirms that this participant's reactions to the test painting cannot be easily characterized on a single dimension of pleasure. Although this participant "...liked looking at the painting very much" (unit 1), "the starkness of the dark blue ... really ... shocked [him] and ... somewhat frightened [him]" (units 4-5). For this participant, pleasurable reactions to the painting coexisted with fright and shock. And, although there "... was a lot of ... tension in the painting that disturbed [him] ... and sadness as well, and ... some anger" (units 8-9), the colour contrasts seen in the work were "very stimulating ... very riveting, ... [he] was mesmerized by [them]" (units 10-11). Again, these contrasts in experienced meaning indicate that a single dimension of pleasure is inadequate to capture this participant's complexly patterned reactions to the painting.

These richly differentiated meanings ascribed to the painting contradict traditional claims that experienced pleasure is the foundation of aesthetic response. On the contrary, we are able to create and integrate meanings for awareness that go beyond simple hedonistic dimensions such as like-dislike, approach-avoid, prefer-not prefer, etc. The results also indicate the value of a research strategy that makes few presuppositions about dimensions of meaning salient to appreciators when contemplating art and asks them to characterize <u>their own</u> reactions during such episodes.

E. Context and Meaning Ascription in Visual Art

Art is a powerful form of human expression because it provides opportunities for us to appreciate spatial, temporal, and expressive correspondences in a way that can enrich and deepen our experience of the world. The research presented here was an attempt to flesh out Wordsworth's nascent theory of how complex and richly integrated meanings are 'given' to us during aesthetic contemplation. I have argued that two sources of context influence meaning ascription during contemplation of visual art: (1) organismic context, defined as conceptual structure, general cognitive processes, and individual knowledge and skills in the arts, and (2) environmental context, the ambient circumstances the art appreciator finds him/herself in. The present research showed the impact of both contextual factors on the creation and integration of meaning.

Have we adequately addressed the phenomenon of concern to Wordsworth? Perhaps not, but the research provides tantalizing hints about the nature of integrative processes in cognition and in the contemplation of visual art that are consistent with Wordsworth's emphasis on 'deeply interfused' meanings and on the constructive capacities of people to 'half-create' such meanings. The theory and research presented here may thus be considered a tentative step toward explicating human capacities to endow life with meaning, drawing on seen, heard, and felt qualities of our life-worlds. These are the phenomena so central to Wordsworth and other authors, phenomena that are often overlooked or bypassed when we uncritically accept stylistic, conceptual, and methodological tools that obscure our understanding of the meaning-making process generally and of aesthetic experience in particular.

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VIII. APPENDIX I
Art Background Questionnaire

PARTICIPANT BACKGROUND QUESTIONNAIRE

INSTRUCTIONS: The first task in the experiment is to provide us with some background information. This information will help us to better understand the results of the study. Remember, all information you provide is confidential, and will not be associated with your name. Please answer all of the questions honestly. You may begin the questionnaire now.

Gender: ____ Female

____ Male

Age: ____ Years

Student I.D. Number: _____
(if applicable)

PLEASE TURN TO THE NEXT PAGE

SECTION I: VISUAL ARTS

1. Have you ever received formal or informal instruction in painting?

____ Yes
____ No

If your answer was yes, briefly describe this instruction in painting below.

2. Do you create visual art (painting, photography, sculpture)
in your own time, or through self-study?

____ Yes
____ No

If your answer was yes, briefly describe these activities in the visual arts below.

3. Have you ever taken coursework in art history or art appreciation?

____ Yes
____ No

If your answer was yes, how many courses in art history or art appreciation have you taken?

____ Number of courses

4. Approximately how many times in the past year have you attended an art gallery with the specific purpose of viewing paintings, sculpture, or photography?

____ Times in the past year

5. How important is painting (viewing paintings or creating them) to your everyday life?

1 2 3 4 5 6 7 8 9

Not at all important — Very Important

6. How easily does visual art (paintings, sculpture, photography) affect your moods and feelings?

1 2 3 4 5 6 7 8 9

Not at all easily — Very Easily

7. To what extent do you consider yourself to be an expert in the visual arts?

1 2 3 4 5 6 7 8 9

Novice — Expert

SECTION II: MUSIC

1. Have you ever received any formal or informal music education (e.g., public or private instruction on a musical instrument)?

----- No
----- Yes 1 2 3 4 5 6 7 8 9 or more years
(circle one)

If your answer was yes, briefly describe this instruction on a musical instrument below.

2. Do you play music in your own time, or through self-study?

____ Yes
____ No

If your answer was yes, briefly describe these activities in music below.

3. Approximately how many times per day do you listen to music for more than a 10 minute period?

----- Times per day

4. How important is music (listening or playing) to your everyday life?

1 2 3 4 5 6 7 8 9

Not at all important — Very important

5. How easily does music affect your moods and feelings?

1 2 3 4 5 6 7 8 9

Not at all easily — Very easily

6. How much of an 'expert' in music do you consider yourself to be?

1 2 3 4 5 6 7 8 9

Novice — Expert

SECTION III: LITERATURE

1. Have you ever received formal or informal instruction in creative writing?

____ Yes
____ No

If your answer was yes, briefly describe this instruction in literature below.

2. Do you create fiction or poetry in your own time, or through self-study?

____ Yes
____ No

If your answer was yes, briefly describe these activities in literature below.

3. Have you ever taken coursework in English, creative writing and/or literary criticism?

____ Yes
____ No

If your answer was yes, how many courses in literature and/or literary criticism have you taken?

____ Number of courses

4. Approximately how many times in the past year have you read works of fiction?

____ Times in the past year

5. How important is literature (reading or writing) to your everyday life?

1 2 3 4 5 6 7 8 9

Not at all important — Very Important

6. How easily does literature affect your moods and feelings?

1 2 3 4 5 6 7 8 9

Not at all easily — Very Easily

SECTION IV: GENERAL INFORMATION ON ART INTEREST

1. Which of the following art forms is your favorite, i.e., the type of art you most prefer? (check one category)

____ Painting ____ Music ____ Literature

____ Other (specify): _____

2. How many times per month do you attend cultural events (e.g., concerts, galleries, etc.)?

____ Times per month

YOU HAVE NOW COMPLETED THE BACKGROUND QUESTIONNAIRE. PLEASE INFORM THE RESEARCHER THAT YOU ARE FINISHED.

IX. APPENDIX II
REPRODUCTION OF KLEE TEST PAINTING

X. APPENDIX III

TAPED INSTRUCTIONS (SESSION 1)

FENNO: SESSION #1 TAPE SCRIPT

INTRODUCTION

Before we begin, take a minute to become comfortable. (PAUSE--2 SEC) Make sure that both of your hands are free and that you are sitting comfortably on the chair. Please keep your eyes open for the time being. I will now review the procedures you will follow while listening to this tape recording.

[TONAL/ATONAL CONDITIONS]
This tape is divided into 4 major sections. (PAUSE--5 SEC) In the first section, you will listen to a sequence of relaxation instructions designed to help you physically and then mentally relax. (PAUSE--3 SEC) Following the relaxation instructions, in the second section of the tape, you will hear a short musical selection. At a predetermined time, you will hear a tone that sounds like this (PLAY TONE 5 SECONDS). At the time you hear this sound, you will open the folder placed on the table to your left, and look at a reproduction of a painting for a short period of time. Then, when you hear this sound again (PLAY TONE 5 SECONDS), you will close the folder, turn this cassette recorder off, and report your experiences in as much detail as possible while you saw the painting. You will use a small cassette recorder to tape your verbal report on your experiences while viewing the painting. This small recorder is located to your right, on the table. It has a tape ready for you to record the report of your experiences while viewing the painting. (PAUSE 7 SEC) So, to review what you will be doing while you hear this tape, you will first listen to a set of physical and mental relaxation instructions. Second, you will hear a short musical selection. Third, you will hear the tone, open the folder located on the table to your left, and look at a painting. Fourth, you will hear the tone again, stop this tape recording, and report your experiences while you viewed the painting, using the small recorder located to your right on the table. After you have used the small recorder to tape record your experiences, you will be finished, and can open the door to let the researcher know that you are done. (PAUSE--5 SEC) If you have any questions about the way this procedure will work, please stop this tape now, and ask the researcher. (PAUSE--5 SEC) If you do not have any questions, we will start with the first task. (PAUSE--7 SEC)

[NO MUSIC CONTROL CONDITION]
This tape is divided into 4 major sections. (PAUSE--5 SEC) In the first section, you will listen to a sequence of relaxation instructions designed to help you physically and then mentally relax. (PAUSE--3 SEC) Following the relaxation instructions, in the second section of the tape, you will have a period of silence in order to concentrate on your breathing and your relaxation.

At a predetermined time, you will hear a tone that sounds like this (PLAY TONE 5 SECONDS). At the time you hear this sound, you will open the folder placed on the table to your left, and look at a reproduction of a painting for a short period of time. Then, when you hear this sound again (PLAY TONE 5 SECONDS), you will close the folder, turn this cassette recorder off, and report your experiences in as much detail as possible while you saw the painting. You will use a small cassette recorder to tape your verbal report on your experiences while viewing the painting. This small recorder is located to your right, on the table. It has a tape ready for you to record the report of your experiences while viewing the painting. (PAUSE 7 SEC) So, to review what you will be doing while you hear this tape, you will first listen to a set of physical and mental relaxation instructions. Second, you will have a short period of silence to concentrate on your breathing and relaxation. Third, you will hear the tone, open the folder located on the table to your left, and look at a painting. Fourth, you will hear the tone again, stop this tape recording, and report your experiences while you viewed the painting, using the small recorder located to your right on the table. After you have used the small recorder to tape record your experiences, you will be finished, and can open the door to let the researcher know that you are done. (PAUSE--5 SEC) If you have any questions about the way this procedure will work, please stop this tape now, and ask the researcher. (PAUSE--5 SEC) If you do not have any questions, we will start with the first task. (PAUSE--7 SEC)

1. RELAXATION INSTRUCTIONS (ALL CONDITIONS)

In this first part, I will give you some instructions to help you physically relax and reduce muscular tension. To do this, I will ask you to tense and then relax various muscles in your body, noticing how relaxed muscles feel when compared with tense muscles. Then, I will encourage you to become as relaxed as possible.

All right, find a comfortable position on the chair so that you don't feel cramped or constrained. (PAUSE 5 SEC) Now, I'd like you to close your eyes. Please keep your eyes closed throughout the relaxation instructions. I think you will find that closing your eyes adds to the sense of privacy and of having your thoughts and feelings to yourself as we do this. (PAUSE 3 SEC) Now, just take in a few deep breaths and start to relax. (PAUSE 7 SEC)

Now, focus your complete attention on your arms, ranging from your shoulders to the tips of your fingers. Now, I'd like you to tense both of your arms by making two fists and extending the tension all the way up to your shoulders. Hold that tension now (PAUSE 4 SEC) OK, relax ... let all of the tension go out of your arms. Feel the heaviness of your arms as they become completely relaxed. Notice the different way your arms feel as they become completely relaxed (PAUSE 7 SEC)

Next, I would like you to tighten the muscles in your shoulders, neck, and muscles surrounding your forehead. Tense those muscles now by furrowing your brow, tensing your neck, and pulling in your shoulder blades as if to touch them together. Hold that tension now, and notice the tension in your shoulders, neck, and forehead. (PAUSE 4 SEC) All right, relax ... Let all of the tension drain out of your forehead, neck, and shoulder muscles. Again, feel the heaviness of those muscles as they begin to completely relax. Notice the difference between the tension you just felt and the heavy relaxed way your forehead, neck and shoulders feel now (PAUSE 7 SEC)

Now, I would like you to tighten the muscles of your stomach, chest, and lower back. Sit up slightly in the chair, and tense your stomach, chest and lower back. Hold that tension now, and notice the tension in those muscles. (PAUSE 4 SEC) All right, relax ... Sit back down in the chair and let all of the tension drain out of your stomach, chest, and lower back. Again, notice the difference between the tension you just felt and the heavy, relaxed way your stomach, chest, and lower back feel right now (PAUSE 7 SEC)

Next, keep your eyes closed and take in a few more deep breaths (PAUSE 5 SEC) Sometimes, carrying around personal problems and concerns can create tension in spite of being physically relaxed. The remainder of the relaxation instructions on this tape are designed to encourage not only physical but mental relaxation as well. (PAUSE 4 SEC) You may find some of these mental relaxation instructions hard to follow. Yet, I strongly encourage you to try. Many people find that by continuing to try, they can reduce the tension that comes from carrying around personal problems and concerns. Remember, no one will ask you about what personal problems or concerns you reflect on during this portion of the tape. That is private, and to yourself. Keep your eyes closed, and just take in a few more deep breaths. (PAUSE 4 SEC)

As you breathe, begin to pay attention right in the middle of your body, in your throat, chest, and stomach, particularly. In a moment, I am going to ask you to feel what comes in the middle there when you ask yourself: "How do I feel about my life right now?" "What's in the way of me feeling completely alright now?" If something about a personal problem or concern comes to you in response to those questions, just see what it is. Don't work on it or figure it out; just see what that feels like in the middle of your body. (PAUSE 3 SEC) O.K., see what comes right in the middle there, in your throat, chest and stomach, as you ask yourself: "How do I feel about my life right now?" "What's in the way of me feeling completely alright now?" Ask yourself these questions, and see if anything comes to you. Remember, don't work on it or figure it out. Just acknowledge that the feeling is there, in the middle of your body. (PAUSE 15 SEC)

Now, try to imagine that feeling outside yourself for a while. Imagine putting it down beside you on the floor, or

imagine it across the room, or even outside this room altogether. Imagine that feeling far enough away from you to allow some quiet space inside you. Just say to yourself: "Oh yeah, that's there, but I'm going to get some distance from it for a while. I may want to get back to it later, but right now I'm going to see how I feel apart from all that. Try that now, just get some distance from that feeling. (PAUSE 15 SEC)

Now, pay attention to the middle of your body, and see how you feel apart from that problem or concern. Then say to yourself: "What else is there?" "What else is keeping me from feeling completely fine right now?" Try that now, and if you notice something else, don't go into it or figure it out. Just acknowledge that it is there. (PAUSE 15 SEC)

Now, imagine that concern or problem outside you, just like you did with the other one. Imagine putting it across the room, or on the floor, or even outside this room. Try that now, try to get some distance between you and your concern. (PAUSE 15 SEC)

All right, is that all? You may have other concerns preventing you from feeling completely relaxed right now. Just notice what they are. You might even have a background feeling that is always with you. For instance, your always-present feeling might be always trying hard, always a little sad, etc. Try to get some distance from these background feelings as well. Imagine it apart from you--just far enough to allow that quiet, relaxed space inside you to come back. Imagine it on the floor, or even outside the room. See if you can do that with this feeling, or any other problem or concern that is preventing you from feeling completely alright at this moment. Just notice what the feeling is like inside the middle of your body, then distance yourself from it. Try that now, to yourself, until you can again sense that quiet, relaxed space inside you. (PAUSE 20 SEC)

Go once more into that quiet, relaxed space inside you, and say to yourself: "If all those things were solved, or if I could keep them all out there for a while, I'd feel really good right now". See how the middle of your body responds to that. If something feels strange or not quite right when you say that statement, see what it is. Then, put that aside, too, and gain some distance from it. Finally, pay attention to the relief of having your concerns away from you, and the quiet, relaxed space you have made for yourself. Try that now, to yourself. (PAUSE--20 SEC)

All right, that completes the relaxation instructions. I will give you a moment to yourself before we continue. You may open your eyes and stretch if you wish. Please keep the headphones on and the tape running. (PAUSE 20 SEC)

2. MUSIC/CONTROL INSTRUCTIONS

[TONAL/ATONAL CONDITIONS]: Now we will start the rest of the tasks for this session. Let me remind you of what will happen. I am going to play a short musical selection for you. Remember, when you hear this tone (PLAY TONE), keep your

headphones on, and open the folder located on the table to your left. Then, look at the painting inside the folder until you hear the tone again, and wait to receive further instructions. If you have any questions at this point, stop the tape, and ask the researcher. If you do not have any questions, please close your eyes and keep them closed as I begin to play the music. (PAUSE 10 SEC)

[3 MINUTE MUSICAL EXCERPT: CAGE/DEBUSSY]

[PLAY TONE--5 SEC]

[CONTINUE MUSIC FOR 1 MINUTE]

[PLAY TONE-- 5 SEC]

O.K., please close the folder and put it on the table to your left. Now, I would like you to prepare to describe your experiences while viewing the painting. You will use the small tape recorder located on the table to your right. After you press play and record, please describe your experiences as you viewed the painting in as much detail as possible. Your reactions may include thoughts, feelings, or impressions about the painting itself. Or, your reactions may include general statements about viewing the painting in this research setting. Whatever is the case for you, please describe your experieces in as much detail as you can while the small machine is recording what you say. Please speak audibly, so that the tape recorder can record what you say. When you are finished describing your experiences of the painting in as much detail as possible, you can turn the minicassette recorder off, and open the door to let the researcher know that you are done. (PAUSE 5 SEC) O.K., take the headphones off now, stop this tape recording, start the small machine recording, and report your experiences of the painting in as much detail as you can. Please begin.

[NO MUSIC CONTROL]: Now we will start the rest of the tasks for this session. Let me remind you of what will happen. I am going to give you a period of time to close your eyes, continue relaxing, and concentrate on your breathing. Remember, when you hear this tone (PLAY TONE), keep your headphones on, and open the folder located on the table to your left. Then, look at the painting inside the folder until you hear the tone again, and wait to receive further instructions. If you have any questions at this point, stop the tape, and ask the researcher. If you do not have any questions, please close your eyes and keep them closed as I begin the period of silence. (PAUSE 10 SEC)

[3 MINUTE PERIOD OF SILENCE]

[PLAY TONE-- 5 SEC]

[CONTINUE SILENCE FOR 1 MINUTE]

[PLAY TONE-- 5 SEC]

O.K., please close the folder and put it on the table to your left. Now, I would like you to prepare to describe your experiences while viewing the painting. You will use the small tape recorder located on the table to your right. After you press play and record, please describe your experiences as you viewed the painting in as much detail as possible. Your reactions may include thoughts, feelings, or impressions about the painting itself. Or, your reactions may include general statements about viewing the painting in this research setting. Whatever is the case for you, please describe your experieces in as much detail as you can while the small machine is recording what you say. Please speak audibly, so that the tape recorder can record what you say. When you are finished describing your experiences of the painting in as much detail as possible, you can turn the minicassette recorder off, and open the door to let the researcher know that you are done. (PAUSE 5 SEC) O.K., take the headphones off now, stop this tape recording, start the small machine recording, and report your experiences of the painting in as much detail as you can. Please begin.

XI. APPENDIX IV

RELAXATION, MUSIC, AND PAINTING QUESTIONNAIRES

S # _____

QUESTIONNAIRE: RELAXATION INSTRUCTIONS

INSTRUCTIONS: Please read each of the following questions carefully, and answer each as accurately as possible by circling a number on the scale that follows each item. Please try to reflect your thoughts and feelings during the tape-recorded relaxation instructions as directly as possible. Do not put your name on this questionnaire.

1. How easy or difficult were the relaxation instructions to follow?

1 2 3 4 5 6 7 8 9

Extremely Easy — Extremely Difficult

2. How relaxed or tense did you feel after the physical relaxation portion of the tape (i.e., after you tensed and relaxed various muscles)?

1 2 3 4 5 6 7 8 9

Extremely Relaxed — Extremely Tense

3. How relaxed or tense did you feel after the mental relaxation portion of the tape (i.e., after you distanced yourself from your problems or concerns)?

1 2 3 4 5 6 7 8 9

Extremely Relaxed — Extremely Tense

4. How distracted did you feel while listening to the tape recorded instructions?

1 2 3 4 5 6 7 8 9

Not at all Distracted — Extremely Distracted

5. How easy or difficult was it for you to attain relaxation by listening to the tape recording?

1 2 3 4 5 6 7 8 9

Extremely Easy — Extremely Difficult

T1 T2 S # _____

QUESTIONNAIRE: LISTENING TO THE MUSIC

INSTRUCTIONS: Please read each of the following questions carefully, and answer each as accurately as possible by circling a number on the scale or replying to a question. Please try to reflect your thoughts and feelings while hearing the music as directly as possible. Do not put your name on this questionnaire. Please begin.

1. How long do you think the music was played before viewing the painting?

   _____ Minutes

2. How distracted were you when you listened to the music?

   1 2 3 4 5 6 7 8 9

   Not at all distracted — Extremely Distracted

3. To what extent were you aware of your feelings when you listened to the music?

   1 2 3 4 5 6 7 8 9

   Not at all aware of feelings — Extremely aware of feelings

4. For the following items, rate your overall impression of the music you heard on the scales below:

   1 2 3 4 5 6 7 8 9

   Boring — Interesting

   1 2 3 4 5 6 7 8 9

   Tranquil — Tense

   1 2 3 4 5 6 7 8 9

   Awful — Nice

   1 2 3 4 5 6 7 8 9

   Static — Dynamic

1	2	3	4	5	6	7	8	9	
Quiet									Noisy
1	2	3	4	5	6	7	8	9	
Repetitive									Random
1	2	3	4	5	6	7	8	9	
Beautiful									Ugly
1	2	3	4	5	6	7	8	9	
Subtle									Bold
1	2	3	4	5	6	7	8	9	
Passive									Active
1	2	3	4	5	6	7	8	9	
Worthless									Valuable
1	2	3	4	5	6	7	8	9	
Weak									Powerful
1	2	3	4	5	6	7	8	9	
Unpleasant									Pleasant
1	2	3	4	5	6	7	8	9	
Mild									Intense
1	2	3	4	5	6	7	8	9	
Dead									Alive

5. How familiar was this particular piece of music to you?

1 2 3 4 5 6 7 8 9

Not at all familiar — Extremely familiar

6. How familiar was this style of music to you?

1 2 3 4 5 6 7 8 9

Not at all familiar — Extremely familiar

7. Would you like to hear more of the music? ____ Yes ____ No

If you answered yes, rate your desire to hear more of the music on the scale below:

1 2 3 4 5 6 7 8 9

Very low desire to hear more — Very great desire to hear more

S # _____

QUESTIONNAIRE: VIEWING THE PAINTING

INSTRUCTIONS: Please read each of the following questions carefully, and answer each as accurately as possible by circling a number on the scale or replying to a question. Please try to reflect your thoughts and feelings while viewing the painting as directly as possible. Do not put your name on this questionnaire. Please begin.

1. How long do you think you saw the painting for?

_____ Minutes

2. How distracted were you when you viewed the painting?

1 2 3 4 5 6 7 8 9

Not at all distracted — Extremely Distracted

3. To what extent were you aware of your feelings when you viewed the painting?

1 2 3 4 5 6 7 8 9

Not at all aware of feelings — Extremely aware of feelings

4. For the following items, rate your overall impression of the painting you saw on the scales below:

1 2 3 4 5 6 7 8 9

Boring — Interesting

1 2 3 4 5 6 7 8 9

Tranquil — Tense

1 2 3 4 5 6 7 8 9

Awful — Nice

1 2 3 4 5 6 7 8 9

Static — Dynamic

1	2	3	4	5	6	7	8	9	
Quiet									Noisy
1	2	3	4	5	6	7	8	9	
Repetitive									Random
1	2	3	4	5	6	7	8	9	
Beautiful									Ugly
1	2	3	4	5	6	7	8	9	
Subtle									Bold
1	2	3	4	5	6	7	8	9	
Passive									Active
1	2	3	4	5	6	7	8	9	
Worthless									Valuable
1	2	3	4	5	6	7	8	9	
Weak									Powerful
1	2	3	4	5	6	7	8	9	
Unpleasant									Pleasant
1	2	3	4	5	6	7	8	9	
Mild									Intense
1	2	3	4	5	6	7	8	9	
Dead									Alive

5. How familiar was this particular painting to you?

1 2 3 4 5 6 7 8 9

Not at all familiar — Extremely familiar

6. How familiar was this style of painting to you?

1 2 3 4 5 6 7 8 9

Not at all familiar — Extremely familiar

7. Would you like to see this painting again? ____ Yes ____ No

If you answered yes, rate your desire to see this painting again on the scale below:

1 2 3 4 5 6 7 8 9

Very low desire to see again — Very great desire to see again

PLEASE INFORM THE RESEARCHER THAT YOU HAVE COMPLETED THE QUESTIONNAIRE.

XII. APPENDIX V

INTERVIEW/HYPOTHESIS AWARENESS

INTERVIEW

Notes: (1) Please complete one of these sheets for every participant. Briefly record the participants' answer to each question. (2) If participant heard Tape #3 (no music), start the interview with the following question: "How many minutes of silence occurred before you viewed the painting?

_____ Minutes

1. First of all, are there any questions you would like to ask about the experiment so far?

2. Was the purpose of the study made clear? Was the procedure itself, as well as the tasks involved, sufficiently explained to you?

3. Is there anything about the experiment so far that was disrupting, puzzling, or that you wondered about?

4. Could you describe in your own words what you think the experiment is about so far?

5. Did it occur to you that there might be something more to the experiment than I have explained so far? If so, when did you think this?

---

6. Did you think that there was some relationship between the music you heard and the painting you saw? What did you think this relationship was? When did you think this?

7. Is there anything more you'd like to say about your experience of the painting?

XIII. APPENDIX VI

SIMILIES TEST

S # _____

SIMILES

On the following pages, you will be asked to finish a number of incomplete sentences, such as " Cool as a _____".
For each sentence, tru to think up three different endings. Make your endings as imaginative as you can. Try to think up fresh new endings that nobody has heard before.

For example, Cool as a cucumber is a tired ending that has been used quite often, while Cool as a polar bear on an iceberg is fresher, more unusual ending. If you can't think of an appropriate ending, go on to the next sentence. You can come back later when an idea comes to you. Remember, make your endings as unusual as possible.

Work relatively quickly and try not to take more than 15 minutes or so to complete the questionnaire.

Please try to write legibly
You may turn the page and begin

SIMILIES

1. The house was as silent as

2. The fish felt slippery, like

3. The elephant looked as huge as

4. The moon in the sky looked lonely, like

5. The sunset was as colorful as

6. The laundry smelled fresh, like

7. The butterfly was as beautiful as

_____

_____

_____

8. The siren sounded piercing, like

_____

_____

_____

9. The music sounded as lively as

_____

_____

_____

10. The small boy felt helpless, like

_____

_____

_____

XIV. APPENDIX VII

DEBRIEFING

FENNO--DEBRIEFING

The tasks you completed in this experiment will help us to understand processes of art contemplation. The first goal of this study was to investigate how different musical contexts influence interpretations of an ambiguous painting. The second goal of this study was to investigate how individual differences affect responses to paintings and music.

To study how musical contexts affect responses to a painting, people who participated in the Session #1 were randomly assigned to one of three groups. One group heard pretty, melodic piano music prior to viewing the painting. A second group heard harsh, atonal piano music prior to viewing the painting. Finally, a third group of people (a control condition) heard no music prior to viewing the painting. Together, these 3 groups (melodic music, random music, and no music control) constitute the independent variables for session #1. We believe that exposure to music of different types will influence how people interpret the ambiguous painting, e.g., if you heard harsh, strange music prior to seeing the painting, it might be interpreted as a strange, alien monster, etc. The tape-recorded reports of reactions to the painting will be transcribed and analyzed. On the basis of the verbal reports, we will derive several dependent variables (e.g., themes of reported experience) for the first experimental session.

The second goal of the study was to investigate individual differences in responses to paintings and music. We believe that 3 skills underlie how people meaningfully react to paintings and music. The first skill is called figure-ground differentiation, and refers to the ability to see fragmented or ambiguous pictures as representing distinct objects or events. When you provided object descriptions of the fragmented black and white pictures and the ambiguous coloured paintings, we were assessing this skill. A second skill underlying people's ability to respond to paintings and music is called synaesthesia, and refers to the ability to experience meanings in one modality (e.g., colours) in response to information presented to another modality (e.g., music). When you matched colours to tones and mood descriptions, we were assessing synaesthetic skill. Finally, a third skill of interest is called metaphoric thinking. This refers to the ability to generate novel concepts in response to presented words or images. The Similies test and the Symbol Equivalents test both assess metaphoric thinking.

It is possible that general personality traits predict success in the 3 skills described above. We also assessed your scores on the Absorption Scale, a measure of normal variations in attention and self-altering experiences. We are not interested in anyone's particular score on this scale, but will use the group data to see if Absorption predicts success in the 3 skills described above.

Thank you very much for participating. We remind you again that your data is confidential. If you are interested

in obtaining a preliminary copy of the results of the study, drop a note to Cam Wild, Department of Psychology, University of Alberta, T6G 2E9.